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INSTITUTE OF ARCHITECTS OF NEW SOUTH WALES

SPECIAL GENERAL MEETING

TUESDAY, 2nd JUNE 1925

At 8 p.m.

SIR CHARLES ROSENTHAL (PRESIDENT) occupied the Chair.

MR. DAY (SECRETARY) read the Notice convening the Meeting.

MR. PEDDLE informed the meeting that an explanatory letter had been sent with the notice, from which members would see that this matter of amendments to the Articles of Association was dealt with some months ago. They were advised, however, that, because of some possible legal informality, it would be wise to formally pass the amendments again. He moved:

1. That the Articles of Association be altered in the manner following:—

That clauses numbered 3, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17. 22, 23, 24, 25, 26, the section title on page 8 "Expulsion or suspension of members," 27, 28, 29, 30, 31, 32, 34, 40, 49, 52, 76, 77, and forms A, I., II., III., VII., VIII., be and hereby are deleted from the existing regulations as contained in the Articles of Association.

That clauses numbered 4, 7, 19, 21, 33, 35, 36, 37, 38, 39, 44, 46, 47, 50, 51, 53, 60, 62, 63, 64, 71, 72, 73, 78, 79, 80, 87, forms B, IV. V., VI., IX., and letter forms I., II., be and hereby are amended by the omission and/or addition of certain words as set out hereunder.

That new clauses numbered 3/n, 8/n, 13/n, 14/n, 15/n, 16/n, 22/n, 24/n, 25/n, 26/n, Special Provisions, Professional Conduct, 28/n, 29/n, 31/n, 40/n, and letter forms VII., and VIII., as set out hereunder be and hereby are added to the aforesaid Articles of Association.

3/n The Institute of Architects of New South Wales shall consist of Life Members, Members and Honorary Members, either subscribing or non-subscribing, as may be hereafter established by the Institute.

4 Substitute the word "Members" for "Fellows."

7 Substitute the word "Member" or "Members" for "Fellow" or "Fellows."

Substitute the word "persons" for "gentlemen" and "such person" for "he."

8/n Members shall be persons whose names appear as Fellows and Associates on the Register of the Institute of Architects N.S.W. on December 1st, 1924, and thereafter persons engaged in the practice of architecture whose names appear on the Register of The Board of Architects N.S.W. as entitled to practise and who have been duly elected under provisions in paragraphs Nos. 15/n-26/n.

13/n Every member shall be entitled to obtain a certificate of Membership subject to such conditions and on payment of such subscriptions or other sums as the Council may from time to time prescribe, and any such person ceasing to be a Member shall on demand deliver back to the Council his certificate of Membership.

14/n A Member may use after his name the initials M.I.A., but a member practising with any person not a member of the Institute shall not use after the title of the firm the aforesaid abbreviated form or initials, or describe the firm as members of the Institute.

15/n All persons desirous of being admitted as Members must be proposed according to the nomination form IV. appended to these Articles. The Christian name, Surname and usual place of residence of each candidate shall be inserted in his nomination form, and this form must be subscribed by such person, and by at least three members who shall certify their personal knowledge of the candidate. Provided that the Council may if satisfied with such person's qualifications have power to nominate a candidate and dispense with the separate written statement to be made by a member as required in Form VI.

16/n The nomination paper must be accompanied by the amount of entrance fee and first annual subscription, and by a written statement in Form V. by the applicant, and by another written statement in Form VI. by one of the Members who has signed the nomination paper giving particulars of his acquaintance with the candidate. The names and addresses of nominees shall be stated upon the circular convening an ordinary meeting prior to that at which it is proposed to ballot for the admission to membership of such nominee.

19 Substitute the words "the Council" for "they" "he or she" for "he," and add—"provided that his or her nomination papers have been posted for inspection in the rooms of the Institute for not less than seven (7) days prior to such meeting.

21 Substitute the word "Membership" for "Fellowship."
22/n In the absence of any such dispensation, the election of any member shall take place at ordinary meetings only, and by ballot. The name and address of the candidate, with the names of his or her proposers, shall be stated in full upon the circular convening the meeting at which such election is to take place. At least fourteen days' notice of an election shall be given.

The voting shall be by marble ballot and a candidate shall be admitted on a four-fifths majority of votes.

No person who has been excluded from election, or rejected at an election shall be again proposed for election within a period of twelve calendar months.

If there are several candidates, a collective ballot may be taken; should an excluding number of black balls appear the collective ballot shall be declared void and each candidate shall be balloted for separately.

24/n When a person is elected the Honorary Secretary shall immediately inform such person of his or her election by Letter in Form No. 1, and no person shall be considered entitled to the rights and privileges of membership until he or she shall have made the statutory declaration marked A. and lodged the same with the Honorary Secretary. If the declaration shall not have been lodged within two months from the date of election the election shall be void, and shall be declared so by the Council after two weeks' notice by letter in Form No. II., unless the delay be explained to their satisfaction in the meantime.

25/n Every member shall be required to make, as soon as possible after his or her election, the declaration in the Form A., and having likewise paid entrance fee and first annual subscription such person shall be admitted at the first meeting of the Institute at which he or she may be present.

26/n The President (or Chairman of the meeting) addressing the candidate by name shall say "As President (or Chairman) of this meeting, I hereby admit you a Member of the Institute of Architects of New South Wales."

SPECIAL PROVISION.

At any time prior to 31st January, 1925, all Registered Architects who are members of the Architects Association on 31st December, 1924, shall be accepted without ballot or entrance fee as Members of the Institute of Architects, upon their nomination forms being signed by the President, Vice-President, and Honorary Secretary of such Architects Association.

PROFESSIONAL CONDUCT.

28/n The Council may from time to time make By-Laws relative to the conduct of Members, such By-Laws being subject to ratification at the Regular or Special General Meeting of the members next ensuing.
29/n The Council may at any time by notice in writing require a member to attend a meeting of Council to be held not less than seven days after the service of such notice. The notice shall be of the form or to the effect of letter form VII.

After the expiration of such notice, whether or not the member notified has attended such meeting, the Council may by notice in writing served as hereinafter provided require a member to withdraw from the Institute and the person so required to withdraw shall at the expiration of one month from such notice being given cease to be a Member. The notice shall be on the form or to the effect of Letter-form VIII., and shall be sent by registered mail to such Member to his address as entered in the Register of Members. The serving of such notice to withdraw upon a Member shall be decided by resolution of a majority of at least three-fifths of the members of Council present and voting at the Council Meeting.

Provided that a Member upon whom such notice is served may within fourteen days of such service give notice of an appeal against the action of the Council. Upon receipt of such notice of appeal the Council shall convene a special general meeting of Members to hear such appeal.

A majority of not less than three-fourths of the Members present at such last-mentioned special meeting shall have power to annul the requirement to withdraw, or to annul it subject to the performance of any conditions which the meeting may think fit to impose.

31/n The entrance fee of each Member shall be two guineas, and the annual subscription two guineas or such other sums, with Educational, Federal, or other special levies added, as may from time to time be agreed to. Life Members shall be exempt from payment of subscriptions.

33 Substitute the word "Members" for "Fellows."

35 Substitute the words "his or her" for "his" and "he or she" for "he."

Omit the words "Fellows, or four Fellows and one Associate" and substitute the word "Members."

36 Substitute the words "his or her" for "his."

37 Substitute the words "his or her" for "his" and the words "him or her" for "him."

38 Substitute the word "member" for "Fellow or Associate" and the words "his or her" for "his" and "him or her" for "him."

39 Substitute the word "Member" for "Fellow or Associate," "Members" for "Fellows or Associates" and the words "he or she" for "he" and "his or her" for "his."

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CONSTITUTION OF COUNCIL, ETC.

40/n There shall be a Council which shall consist of a President. the Past-President, one Vice-President, two Vice-Chairmen, Honorary Treasurer, Honorary Secretary, Assistant Honorary Secretary, and nine other members. The above, except the Past-President, shall be elected at the Annual General Meeting as Articles 60 and 79 prescribe. Any member shall be eligible to serve as a member of Council.

44 Insert "a Vice-Chairman" before "Honorary Secretary."

46 Substitute the word "Members" for "Fellows."

47 Add after the word "annum" and before "such," "or such other sum as may from time to time be agreed to."

PRESIDENT AND OFFICE-BEARERS.

50 Add after the word "Vice-President" and before "or" "one of the Vice-Chairmen," and substitute the word "Member" for "Fellow."

51 Substitute the word "Member" for "Fellow."
53 Substitute the word "Member" for "Fellow."

ELECTION OF COUNCIL.

60 Add the words "two Vice-Chairmen" after "Vice-President," add after "Secretary" the words "Assistant-Honorary Secretary," add after the word "Council" and before "shall hold" the words "together with those nominated by the existing Council to fill vacancies created by these Articles."

Substitute the figures "1925" for "1920."

62 Add the words "Vice-Chairman" after "Vice-President." Omit the words and brackets "(if any)." Omit the words "either Fellows or Associates."

63 Substitute the words "Members not less than" for "Fellows and Associates."

64 Substitute the word "Members" for "Fellows" and the word "Member" for "Fellow and Associate."

GENERAL MEETING.

71 Substitute the words "seven Members" for "four Fellows and one Associate."

72 Substitute the word "Member" for "Fellow" and "Associate."

73 Substitute the words "Member or" for "Fellow" and "Member" for "Fellow or Associate."

78 Substitute the word "Members" for "Fellows."

ANNUAL MEETING.

79 After the words "month of" and before "February" add the word "January."

80 Omit "Five Fellows or."

Substitute the word "Members" for "Associates" and "seven members" for "seven Fellows."

COMMON SEAL.

87 Add "one of the Vice-Chairmen" after "Vice-President," and substitute "Member" for "Fellow."

FORMS.

Form of Statutory Declaration to be made by a Member. FORM B. Substitute the letter "A." for "B." and the words "a Member" for "an Associate" in title.

Substitute the words "a Member" for "an Associate."

Substitute "That my name appears on the Register of The Board of Architects, N.S.W., and that I" for "and" between "Architecture" and "have."

Omit footnote.

FORM IV. Omit the word "Associate" in title.

Substitute the word "Member" for "Associate" and "Fellow" and "Members" for. "Fellows or Associates."

FORM V. Omit the word "Associate" in title. Substitute the words "a Member" for "an Associate," and Article 16/n for Rule 15.

Substitute the words "he or she" for "he" and "his or her" for "his" and "where" for "the locality."

Add to Item III. "or the date on which he or she was registered by the State Board of Architects of N.S.W., as entitled to practise," and change the number from "III." to "VI." Insert between "II." and "VI." items "III." "IV." and "V." from form II. on page 22, but substitute the words "he" or "she" for "he" where the latter word occurs, and substitute the words "If practising" for "The" in item III.

FORM VI. Omit the word "Associate" in title. Substitute the words "Member" for "Fellow," "a Member" for "an Associate" and "he or she" for "he."

Omit the words "as Associate" and (as signature) the word "Fellow."

FORM IX. Substitute the word "Member" for "Fellow" in title.

Substitute the word "Member" for "Fellow" and "Members" for "Fellows."

LETTER FORMS.

Letter Form I. Substitute the word "Member" for "here state the class of membership."

Letter Form II. Substitute the word "Member" for ("Fellow or Associate.")

Letter Form VII. To a Member required to attend a Council meeting under clause 29n.

Sir or Madam,—

You are requested to attend a meeting of the Council of the Institute of Architects of New South Wales on between and pursuant to the Articles of Association Clause 29n.

I am, Sir or Madam,
Your obedient servant,
....
Honorary Secretary.

Letter Form VIII. To a Member required to withdraw.
Sir or Madam,—

It is my duty to inform you that by resolution of the Council of the Institute of Architects of New South Wales pursuant to the Articles of Association Clause 29n you are required to withdraw from the Institute.

Clause 29/n reads:—

"The Council may at any time by notice in writing require a member to attend a meeting of Council to be held not less than seven days after the service of such notice, The notice shall be of the form or to the effect of letter form VII. After the expiration of such notice, whether or not the member notified has attended such meeting, the Council may by notice in writing served as hereinafter provided require a member to withdraw from the Institute and the person so required to withdraw shall at the expiration of one month from such notice being given cease to be a Member. The notice shall be on the form or to the effect of Letter-form VIII., and shall be sent by registered mail to such Member to his address as entered in the Register of Members. The serving of

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such notice to withdraw upon a Member shall be decided by resolution of a majority of at least three-fifths of the members of Council present and voting at the Council Meeting.

Provided that a Member upon whom such notice is served may within fourteen days of such service give notice of an appeal against the action of the Council. Upon receipt of such notice of appeal the Council shall convene a special general meeting of Members to hear such appeal.

A majority of not less than three-fourths of the Members present at such last-mentioned special meeting shall have power to annul the requirement to withdraw, or to annul it subject to the performance of any conditions which the meeting may think fit to impose.

I am, Sir or Madam,
Your obedient servant.

....
Honorary Secretary.

MR. ANDERSON seconded the motion.

MRS. TAYLOR moved the following amendments:—

(a) That the draft be revised so that the numbers read consecutively instead of darting about in hopelessly confusing letters and numbers.

(b) That Clause 86 be deleted in the Miscellaneous.

In all the letter forms there should be "Dear Sir" or "Dear Madam" at the opening and closing of each letter. I would like to have clause 86 deleted, since you are dealing with so many clauses, as it mentions "copyright publications." That cannot be, according to the Copyright Act. I know if I put "copyright" on any publication that I did not copyright, I am subject to a penalty of £20. Then you indicate that this Institute has power to copyright the papers read here. That is not so, unless they have been authorised to do so by the author of the paper for a consideration. Altogether, this is not the intention of the Institute. I am absolutely certain if anybody gave that consideration, they would say it was a piece of bluff. I do know that you cannot copyright. The word "copyright" is wrong. In Clause 7 on page 5 "gentlemen" and "he" should be "persons."

In Clause 57 on page 15 it has got "the Hon. Secretary shall have the charge . . of the Institute." That looks like a misnomer. I think your paper is called "Architecture." I think by that that it might read that this is the name of the Journal. You make provision all the way through for one of the Vice-chairmen in the absence of the President or Vice-President, but I think it is overlooked in Clause 50. In regard to the election of the Council I think two Vice-chairmen are also overlooked in that clause. As you have made provision for it in one part of the paper, I think you intended to be consistent throughout.

MR. PEDDLE: I do not quite understand. This is an amendment to the articles, and the amendment consists of deleting some clauses and inserting some new ones. This 8n., 13n., etc., are of course, in place of 8, 13, etc. I think it is recognised that there may be some further changes required in the Articles of Association in the not very distant future, and the committee who had this in hand felt that the most economical way of handling the matter, and the simplest, was to do it in this way, and attach it to our articles as an amendment. Then later on, when we have been working under this change, if we find some other things are wanted, we can have the whole thing re-cast and re-printed. The purpose of this was to save re-printing the articles right through. As far as Mrs. Taylor's notes are concerned, I think it would be almost necessary for her to write them down.

CHAIRMAN: I think the point Mr. Peddle has raised covers the points of the altered designations. Many alterations have been made solely to make it possible for the Architects' Association to join with us. Now the fusion has come about, there will be the necessity of re-casting them later on. I think the question of numbering might well stand as it is there, in view of Mr. Peddle's explanation. In regard to Clause 86, it seems to me that if any person gives an address to this Institute, and knows from these conditions that his address is the property of the Institute, surely no one else can publish it without the consent of the Institute.

MRS. TAYLOR: This is my advice on the matter.

THE CHAIRMAN read a letter which Mrs. Taylor handed in from a firm of solicitors, and stated that under those conditions it would be necessary to have articles signed before they are copyright.

MR. PEDDLE: This is a little out of my depth, because I have not studied the law of copyright. The Crown Law Office apparently took great interest in our Articles of Association—I do not know why. They must have spent a tremendous amount of time on them, and given the matter a lot of study, and they wrote us and pointed out several things we should do. Then they further pointed out some other things at an interview with our Secretary. Finally these have been submitted to Messrs. Minter, Simpson and Co. One would not expect to find anything dangerous to the Institute in them after having passed these experts.

MRS. TAYLOR: Not dangerous.

MR. PEDDLE: I do not know anything about the point that Mrs. Taylor has raised, but the amended Articles have been subject to this very keen scutiny.

CHAIRMAN: If Mr. Peddle would just amend his motion, I think it would fill the bill. He has moved a resolution that these clauses be ageed to. That may be subject to Clause 86 being again referred to our solicitors, and also the other matter with reference to these letters.

MRS. TAYLOR: I would like to be a dissentient to that clause 86 going into the articles.

MR. ROBERTS seconded Mrs. Taylor's amendment.

(On the amendment being put, it was lost, three members only voting for it).

MR. ROBERTS moved an amendmnet:

> "That the following words be added to the resolution except amendments to Clauses 3 to 8, and such other clauses which affect the classes of membership."

It was the policy of this Institute to keep aloof from the registration of architects. That is, knowing that there would have to be such a big variety of men admitted under the registration of architects, they wanted to keep the Institute on a higher plane, so that the membership of the Institute would give a sort of hall mark. Under this, they did not get a higher status in the Institute.

THE CHAIRMAN said that no man could be admitted without the consent of members. He automatically became eligible for membership.

MR. ROBERTS said that that brought the status down simply to mean that a man only need be a registered architect. The law of the Institute of British Architects was quite different. They were going to try and get registration within the Institute, but all those who were registered, even though registered in the Institute, would not be members of the Institute. That was very different.

THE CHAIRMAN said it was the same here. No registered architect automatically became a member of the Institute. He must be moved and seconded. It must be remembered that in the case of veterinary surgeons, chemists, etc., men were admitted, not because they were considered eligible, but because they had been in practice in their profession for years.

MR. ROBERTS said that they told the public through the Articles of Association that their only status was that they had the qualifications for registration. That was the part he did not like about it.

THE CHAIRMAN said that the question of men who were registered coming into the Institute who were not quite up to the standard they might hope for was only a matter of a short space of time. There would come a time when these men would have passed on. If the Institute safeguarded to itself the election of those whom it wished to become members, that ought to be quite sufficient.

MR. ROBERTS did not think so. He objected to the cutting out of the fellowship and associateship.

THE CHAIRMAN said the whole matter had already been discussed at two meetings, and the question could not be re-opened now. It had been considered very fully. The idea was that immediately the amalgamation was consummated, the rules could be amended as they chose as far as having different classes of membership again. He hoped they would do that before the end of the year. No good purpose would be served by trying to alter it now.

MR. PEDDLE reminded members that the difficulty of admission to the Institute of Architects now, under these proposed amended Articles was very much greater than under the old ones. Under the latter, if a man could only get himself nominated, it was practically impossible to exclude him, because election was by postal ballot, and there had to be a majority of postal votes against him before he could be excluded. Now it was a marble ballot, and quite a small number of black balls was sufficient to exclude him, so the Institute was protected now as it had not been for many years. Before the next meeting notice could be given by any member of a resolution that the Articles be again amended establishing any number of classes, and it could then be discussed on its merits. This was only a scheme for bringing about the fusion of the two bodies.

THE CHAIRMAN said they would realise that because of the gulf that existed between the two bodies prior to their coming together, something had to be sacrificed by the Institute as well as by the Association before the consummation could be given effect to. At the very first meeting it was open to any member to move that the Articles be varied in any way.

MR. ANDERSON said they should recognise that the present amendments were really a temporary expedient to meet the peculiar conditions, and consequently he thought they were rightly being left in a sort of state of flux until such time as they really found their feet.

MR. MATHERS seconded the amendment. It seemed to him that it was strange that it should be thought necessary to cast the whole of the Articles in the melting pot, and he for one failed to understand why that should be necessary. He did not see why the titles of Fellows and Associates should not be retained. The main objection was to higher fees.

THE CHAIRMAN said that was not the objection.

MR. MATHERS said it was a strange method to adopt to bring those gentlemen in by practically scrapping the whole of the Constitution, which had been carefully worked up, and followed the lines set down by the parent Institute. It was a lowering of the status, even if it was only temporary. The Council should evolve some method by which it could retain those titles.

THE CHAIRMAN said the Council had not gone to all this enormous amount of trouble without having used up all possible means of doing it in a simpler way. Some members of the Association, while fully qualified, were not eligible because of their period of practice, and that was one of the reasons why they did not want to make invidious distinctions. It was unfair that they should be kept out. Their action had not been taken with a view to lowering the status of the profession.

They considered it necessary to make these amendments, sacrifices though they might be. He did not admit that they had scrapped the whole of the Constitution.

MR. MATHERS said the fees of the Fellows had been reduced by half, and the fees of Associates who had hitherto had concessions, architects in the Government service who were not allowed to practise outside, were now the same. He did not know why they had all been brought into the same mark.

MR. PEDDLE pointed out that the seconder had it in his hands to move at the next meeting that the fees of Government servants should be omitted, doubled or halved. The matter was all discussed and passed in December last year. The Institute had been carried on under these amended Articles, and if the resolution was not passed, as a matter of form, to-night, the chaos that would result was inconceivable, because those who were at present members of the Institute, the late members who had been elected, would be no longer members. It just made one's head giddy to think of what would happen if the matter was now reversed.

(Amendment was lost, the voting being 4 for and 10 against).

(The original resolution was carried, voting being 10 for and 4 against).

MR. PEDDLE moved:

> (2) That all acts of the Council and of the Members of the Institute as on and from 1st December, 1924, under the Articles of Association as purported to be altered on that date be, and the same are hereby confirmed.

MR. ANDERSON seconded.

(Carried).

ORDINARY GENERAL MEETING

2nd JUNE

The minutes of the general meeting held on the 5th May were confirmed on the motion of Col. Hurst, seconded by Mr. Waterhouse.

Apologies were received from Mr. Tepper, Mr. C. S. Robertson, and Mr. Denley.

THE CHAIRMAN announced that at the recent A.R.I.B.A. examination Messrs. W. P. Page and S. E. Coleman had passed, news having been received by cable. Mr. James Hurley had donated a book to the library with reference to the fusion of the Architects' Association and the Institute. One of the closing features and not the least pleasant had been the receipt from Mr. Hooke of a cheque for £66/9/2.

The Annual Dinner would be held at the Wentworth Hotel on the 18th June, and on the same day the Federal delegates would commence their sittings. An opportunity would be given of meeting the delegates in a room upstairs. The Governor-General would be present at their dinner, and it would probably be one of the last functions he would attend.

THE CHAIRMAN called on new members to come forward, and gave them a warm hand shake and a welcome to the Institute.

A ballot was taken for the election of new members, and the following gentlemen were unanimously elected:—Messrs. S. G. Evans, C. W. Knight, C. H. Christian, J. H. Robertson, and F. Watson.

THE CHAIRMAN announced that the Exhibition would be opened on Wednesday, 10th June, and continue till the 27th. Lady de Chair had agreed to open it. He trusted there would be a good attendance of members, and that they would help to make it a success by sending in a large number of exhibits.

A MEMBER asked the President if he could give them any idea of the design of the new certificates. Some thought that the last were rather large.

THE CHAIRMAN said he had no information up to date. He thought himself that they should be cut down to about one-third of the present size.

THE CHAIRMAN, in welcoming Mr. Myers, B.E., M.I.E., said it was very gratifying to have members of the allied professions coming and joining with them and giving their help. He had mentioned to the Council that now the Federal authorities had decided to establish a school of Forestry at Canberra, it would be a very good thing if they could get one of their members to give a lecture on Forestry matters. Visits such as that of Mr. Myers' had the dual effect of bringing the allied bodies more closely together, and helping to give their members an outlook which otherwise might be rather restricted. He welcomed Mr. Myers, and asked him now to give his lecture on "Some Impressions Abroad."

SOME OBSERVATIONS ABROAD

BY W. H. MYERS

THE fact that the Institute of Architects of New South Wales has requested that an Address be given that body by an Engineer, and an Electrical Engineer at that, might be construed by the unthinking as a somewhat quaint anomaly, until it is realised that Architects, in common with many persons in other lines of life who design and construct, are keenly interested nowadays in the Design and Construction of Towns and Cities, in addition to their former activities in the building of individual structures. Nevertheless, I must express my personal pleasure at the compliment which you have paid me in asking me to give you some of my impressions whilst recently travelling abroad. In order to be quite frank with you, however, as to the limits which must be placed upon my qualifications to address the following remarks to you, I wish to make a few preliminary personal explanations.

During the early part of last year, the New South Wales Railway Commissioners instructed me to proceed to America and Europe in order to investigate a number of matters in connection with electrical traction and power supplies, and as my first duty necessarily lay in the direction of carrying out my instructions, any observations which I was able to make on Town Planning subjects were more or less fortuitous. Fortunately, being armed with a large array of official and private letters of introduction, and being favoured throughout my tour with exceptionally good luck as to weather conditions, I managed to become generally acquainted with the broader questions of civic interest in the majority of centres visited.

Many of you will have travelled extensively, and, even to those who have not done so, a mere recital of the observed characteristics, both national and personal, of the various peoples visited would, I feel sure, be travelling over ground already too well trodden and, moreover, would occupy too much time and might be considered out of place; nevertheless, it must be quite obvious to everyone that national characteristics play a very vital part in the various Town Planning schemes proposed, or in force, for each centre of population. So, too, does the climate; and it is my opinion that in the great majority of cases in which travellers, or readers of travel, suggest the transplanting of certain civic customs from other countries to this city of ours, the proposals must be very considerably pruned down, or amended, before being acceptable under our particular conditions.

One does not care to generalise, as a matter of principle—it is a very risky process at any time—but it did seem to me to be a general law (if one may use the word in this connection) that a result of climatic differences, even amongst the people of any one country, is a degree of lack of energy and a lessening of civic efficiency in proportion, as the colder climates are left behind and the warmer ones approached. I presume that the more sluggish blood of the individual is reflected in the mass of the people, but anyone who has seen, say, the cleanliness and efficiency of the Swiss cities and their people, as compared with the corresponding qualities of the cities and inhabitants of Southern Italy, or has assessed in this respect even the varied conditions of the North and the South of France, or the energetic Scot alongside the casual Londoner, must have been struck with the general, though, of course, not the universal, variations to which I refer. The same applies to the United States and, although only a Melbourne audience may believe me, to the various latitudes of Australia.

It is true that Art may flourish, even to a greater extent, in the reverse ratio to those qualities indicated as civic virtues, and that the historic associations which embellish and sanctify the works of ancient and modern Italy may outweigh to some extent the comparatively little lauded creations of the North, but I believe that one of the happiest developments of modern bacterial science is the fact that, in spite of the weight of historical precedent, the great bulk of educated opinion is leaning towards cleanliness in our cities, regarded as next to Godliness as it is with humans. By cleanliness, I mean all those reforms in the multitudinous operations of cities that promote a greater degree of comfort, health and efficiency.

But it is not my object to deal altogether with generalities, although my general impressions, gained from a rapid bird's eye view in my travels, have led me, rightly or wrongly, to favour the Town Planning methods and accomplishments of the cooler countries. I feel that no very useful purpose will be served by so doing, but that each of us who has eyes to see and ears to hear should try to offer on our return from abroad some constructive suggestions to meet local conditions as they exist, based upon such observations overseas as appear to have a bearing on developments in Australia.

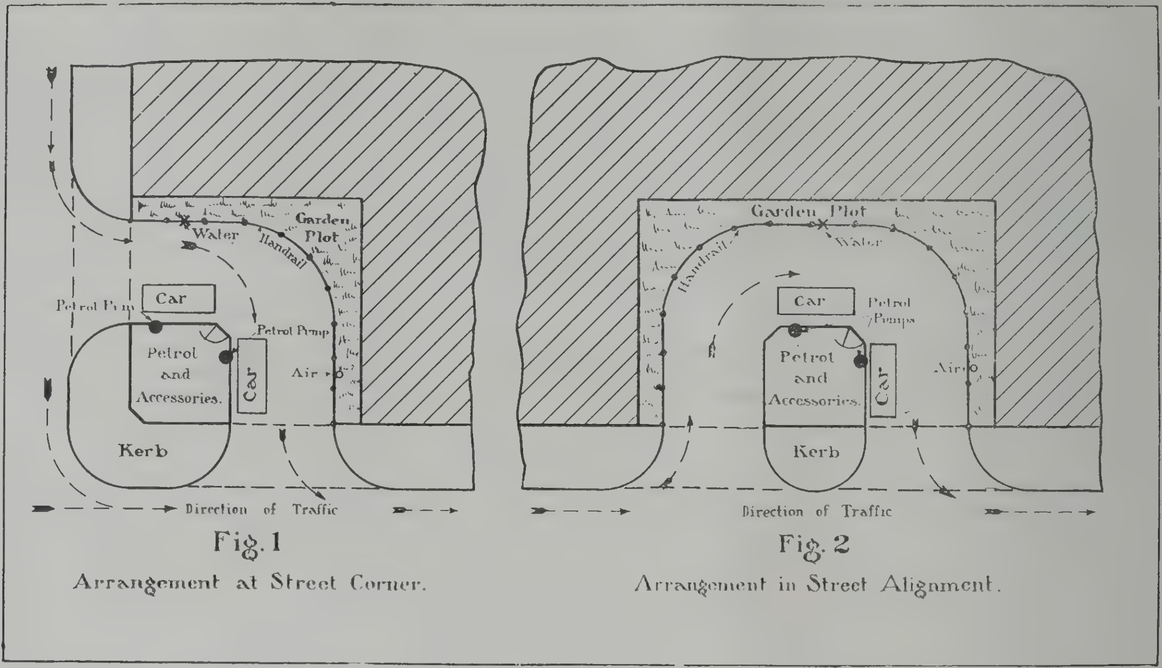


Fig. 1
Arrangement at Street Corner.

Fig. 2
Arrangement in Street Alignment.

DIAGRAM ARRANGEMENTS OF TYPICAL AMERICAN PETROL SUPPLY STATIONS.

PHOTO OF A TYPICAL STREET CORNER PETROL SUPPLY STATION, CALIFORNIA.

I have observed, and propose to mention shortly, a few detail matters of this kind of some importance in civic affairs, but to my mind the all important, the really urgently important, thing to which public attention cannot be too strongly directed is that of the procedure to be adopted for the properly considered development of the city of Sydney and its environs; and this subject very closely affects the State of New South Wales as a whole.

It was only when recently reading, on my return from abroad, an account of the perpetual warfare waging in a number of the South American Republics did I find the solution of a question which had been running through my mind in a somewhat undefined manner as to why it was that, for twenty years past, the public of this city and State had been supplied, almost ad nauseam, with lectures and literature dealing with principles of Town Planning, yet Sydney still lagged far behind all the most modern cities in its lack of any working system of Regional Plan co-ordination. To anyone looking outside the compartment of his own specialised line of business, to leaders of thought in all the professions, to the vast majority of the Governmental and Civic expert officers, to all who are not so entirely concentrated in their own affairs as to be unable to reason from a detached, impersonal point of view on matters of general welfare, the lack of a definite comprehensive plan for the future of the Sydney Region must surely be apparent and beyond any shadow of doubt.

After weighing up all the factors, I have come to the conclusion that the real obstacle to the filling of such an obvious need is the warfare being waged in our community—a kind of see-saw warfare which, whilst it is only classed as political, has much the same paralysing effect on the adequate and natural development of our capital city as the blood and thunder tactics of the South American Republics. It is true that we do not march our party opponents in politics up to the shooting squad in quite the same melodramatic fashion as appears to be the rule in, say, San Paulo

BEACH SCENE AT BIARRITZ, FRANCE.

The view shows the portable umbrella tents, in which several people can be accommodated standing up simultaneously without discomfort. They have light, collapsible centre supports with wooden ribs to the umbrellas, and, being of varied colours and patterns, lend a picturesque air to the scenery.

or Truxillo, but as so many of the governmental and civic activities are obviously swayed by party considerations, and as the "spoils to the victors" policy is frequently accepted without public protest as a necessary corollary to a general election, there does not seem to be, in essentials, so great a difference between our methods and those of the Republics as our apparently peaceful behaviour would lead us to believe.

Now assuming that, for the purpose of graphic description, I have somewhat exaggerated the position and that there do exist on both sides of our political arena, quite honest and earnest workers in the public interest, it must nevertheless be apparent that unless there is in existence a recognised and authorised Body with a continuous Policy, which cannot readily be upset, or marched before the "shooting squad," by any sudden change in the political situation, we cannot, under our recognised political warfare, expect to make any material progress in the preparation and carrying out of a Regional Plan for Sydney, the need for which, even to political party leaders, must be rapidly forcing itself on their attention.

This country and this city is, for better or for worse, largely committed to Governmental activities and does not possess the numbers of extremely wealthy men, who, in certain localities elsewhere have given the means, and the leadership, towards the better planning and development of their home cities. Unless, therefore, a quite unexpected response on a large scale is made to the recent appeals to the private generosity of citizens for this purpose, some other solution for the administration of the desired Plan must be considered, if any progress is to be made.

Such a scheme was submitted to the Treasurer of the State in January of this year, as representing the fully considered opinion of a large number of representative citizens, both technical experts and others, on the Sydney Regional Plan Convention, and, in my opinion, the Executive of any Government that dealt fairly and fully with the details outlined in that proposal would gain, politically and otherwise, much more than it might think to lose, at first sight, by its adoption. The scheme in question provides a means whereby adequate representation of all the essential public interests would be given on a practical Planning Board, by a suitable method of selection by those interests of members, rather than by Government nomination, or by a party election with all its obvious defects under present conditions. The planning of the future city is too involved, and too gigantic a task to be entrusted to any one, two, or three men, however capable, and for that reason it has generally been found necessary in other cases abroad to provide more than a mere Commission for this purpose; in all my conversations on this subject with well-informed people in the various cities, this was agreed and, for our special conditions, the modus operandi, suggested to the Government by the Sydney Regional Plan Convention, seems only to require sympathetic treatment and definite action by a tolerant Executive to ensure success.

All of which may seem not to be apropos to the heading of my address, but as the views expressed are to a large extent a direct result of my impressions abroad I thought it desirable to speak at some length on the subject. To some of you this may be a wearisome subject, but, to my mind, nothing can be more wearisome than national lethargy, even in this, our genial climate.

Under the comprehensive term Town Planning, no observations which omitted the vital question of public transport would be worthy of the name. The least observant traveller must necessarily have views on the subject. But even the *most* observant will scarcely grasp the full significance of what he sees without some understanding of the difficulties and economic features of modern transport, and this understanding cannot be gained by intuition or casual discussion. The solution of our traffic difficulties is a matter for expert traffic opinion, but as this address is dealing with the subject of my personal observations abroad, I thought that you might be interested in the remarks which follow. One speaks somewhat feelingly on this subject in view of the many absurd statements made, in the public press and elsewhere, by ill-informed, though presumably well-meaning, members of our community who have returned from abroad during the last few years.

As anyone with a modicum of transport experience is aware, each traffic problem must be considered on its merits, and expert knowledge and experience brought to bear upon it, before the correct decision can be given. For instance, a system of "trackless trolleys" which may suit the light traffic conditions say, on the outskirts of Leeds, or Bradford, in England, is quite hopelessly inadequate, even for a fairly crowded city, and there are, in fact, very few, if any, cases in Australia at the present time where such a system is justifiable—nevertheless, only a couple of years back a well-known gentleman in the city returned from abroad, and, if the press reports of his views, which were uncontradicted, were correctly given, Sydney might easily expect to wake up one morning to find that the tramlines were to be removed, and the present trams (to use a quite usual comment) to be "wiped off the streets" and superseded by trackless trolleys!

Again, many worthy people return from London firmly, and, I think, sincerely, impressed with the idea that the London traffic operations are particularly ideal, and lead the world in efficiency and economy, and that the London 'buses are an inspiring example to transport authorities the world over.

Now, I wish it to be clearly understood that I am not seeking to make competitive, or, as is usually stated, "invidious" comparisons between the modern electric tram and the modern motor omnibus, because each has its proper sphere of usefulness, but on the subject of London traffic, particularly so far as 'buses are concerned, I would like to give you a few facts for your consideration. As in most of the modern transit systems which I examined in America and Europe, I was extremely fortunate in obtaining in Great Britain first-hand and reliable information from the managers and engineers of the systems under their direction, together with figures and general data as to the operating characteristics of the respective undertakings; and what was perhaps more important from the town-planning point of view, I was given their frank views as to the demerits, as well as the merits, of their transport arrangements, based upon public criticisms. It may surprise many to know that public criticisms of the London traffic arrangements are by no means lacking, even from a public whose forbearance, compared with that of Australian cities, is singularly marked. Whilst in London, Lord Ashfield, the Chairman of both the Underground Railways and the London Omnibus Co., was good enough to give me his personal views on many phases of transport operations in that city, and having heard in Australia so much that was favourable to the London 'bus, I was surprised to hear from him that, as he put it, the 'buses had become "an Old Man of the Sea around his neck." He explained that whilst at first he was very gratified at the ease with which the heavy surface traffic in the city had been carried, the condition as it now existed from his point of view was quite appalling—and that he saw no immediate solution of the congestion caused by the present combination of 'bus and motor traffic, and which has been termed, and quite aptly, the traffic "blockade."

I do not propose to weary you with details and figures on this matter, as these may be found, by anyone desiring to do so, in what is probably the most comprehensive and reliable report yet published on this subject, viz., the Report of the American Electric Railway Association Committee on Foreign Operation, published in the Electric Railway Journal (September 20th, 1924), the leading authoritative periodical in the United States, and which attempts to deal impartially with all types of modern transit systems. I was again fortunate to have the privilege of a discussion of this matter with the three keen and accurate observers who formed that Committee, and who, as will be seen from a study of their report, have expressed themselves at great length on the subject of London traffic. It is interesting to note that during the last few months the London traffic blockade has been partially relieved, as the first action of the new Traffic Committee recently appointed by special Act of Parliament, was the removal from the city of a large number of motor omnibuses to outlying services.

Now, it is a fact that the maximum-hour *surface* traffic in Sydney (i.e., the total number of people actually carried out of the city area proper per square mile of such area by the existing transport system) is greater than any corresponding *surface* traffic in London, in spite of Sydney's comparative lack of radiating roads, due to its configuration. This is, of course, not wholly (although perhaps it is partly) due to expert management or foresight, or to a more energetic population than that in the Old Country. The latter is very doubtful indeed. It is, in my opinion, fundamentally due to the fact that the comparatively mild climate in Sydney has permitted locally the employment of a special type of tramcar which provides for exceptional facilities for rapid loading and unloading of the crush-hour traffic, and partly, of course, due to the higher schedule speeds permitted for tramcars than would be practicable is London without widening or changing the shape of the main traffic streets. In a succession of columns of people in military formation, and these are carried in predetermined definite directions, whereas in London the direction of movement of the 'bus-carried passengers would harass the most expert cross-word puzzle exponents. The actual schedule speed of the City of London surface traffic averages approximately 3 to 4 miles per hour, and this is, of course, extremely exasperating to the vast majority of people on business bent, particularly to visitors from abroad, except, of course, sightseers, to whom a double-deck 'bus has great attractions.

The main objects to be achieved in city transport are to take the working population to and from their homes safely, cheaply, quickly, and with reasonable comfort. No city transport system in the world can entirely satisfy the whole of its population simultaneously in each of these four respects. New South Wales has invested over £10,000,000 of its capital in its city tramway transport system, which is everywhere acknowledged to be efficient, and its people must, therefore, look general, the Sydney design of car provides, in effect very carefully to the future before accepting the dictum of irresponsible suggestions which, in effect, mean ultimately throwing that capital into the gutter.

It is my firm conviction that, even in the event of the roadways in the Sydney Region being properly formed and maintained in the future, the proper utilisation of petrol-driven motor 'buses is more in the direction of acting as feeders and pioneers to the main arterial railway and tramway systems than as competitors to either. The latter course has been aptly demonstrated abroad to be financially unsound to both, and in this country, where so much of the public funds have been, and are being, employed in the provision of rail services, any serious proposals, either by interested, or disinterested, people for a means of competition with these services must be very carefully weighed by the responsible Executive, upon responsible advice.

There are many other phases of this absorbing question which one would like to discuss, but my remarks must necessarily be very limited in a general address of this nature.

May I now be permitted to say a few words on the subject of our sea beaches, in the light of observations abroad. I would start by saying that there are few, if any, seaside beaches seen in my travels that possess the natural beauty of our own, and few places so gifted with our radiant normal sunshine; but I venture to say that if we could permit the whole of our people to see what has been done elsewhere in order to minimise the necessarily artificial and damaging effect of the march of civilisation on to our beaches, there would be no question but that the efforts of the past generations here would have short shrift. I hope to show you, by means of some of the lantern slides that follow, that it is possible to leave a beach, if not as near to Nature as one would wish, at least without the razzle-dazzles and sheds and inartistic concrete structures that are permitted to profane our beaches at present. Australia is, of course, not the only culprit in this direction, as anyone visiting some of the American beaches will confirm, but we could take, with advantage, many leaves from the European book of beach practice (such as those in France and Great Britain); in this reform, the architect must play the biggest part. This will cost money in providing a predetermined plan and in the carrying out of the work over a term of years. But, in my opinion, beach beautification should be, as in city improvement, planned well ahead, and the ultimate advantages to any municipality doing so will be well worth while. (Incidentally, I wish you to note the artistic utility of the beach tents shown on one of the lantern slides).

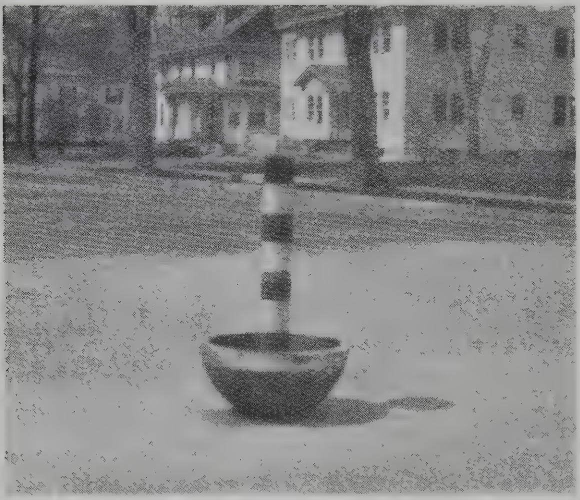


PHOTO OF TRAFFIC "COP."

This is made of one casting about 1ft. 6in.. diameter in the bowl, and whilst difficult to move by hand, will tilt if struck by a road vehicle and automatically right itself again. These are used in the New York suburbs and elsewhere in the United States, and are very successful.

Turning again to road transport, I have exhibited a view of a special traffic "cop" which has found great favour in the New York suburbs, and other views exhibiting special street traffic regulating appliances and traffic density in really congested cities —for whilst Sydney is certainly getting congested, the degree of congestion is quite low in comparison with a large number of American cities and elsewhere. The time has not yet arrived when, as in Paris, or New York, long queues of people are required to stand in the streets during heavy traffic waiting their opportunity to plunge into the bowels of the Underground Transport systems, or to be dispersed by the police when the pressure becomes too great. Nor do we yet find it necessary to "synchronise" our surface traffic movements as the only means of avoiding utter confusion. Yet the need for regulation is obvious, and that regulation should, I think, be considered only in conjunction with a fully-matured system of roads, rails and general transport.

I would like to add a note to the subject of facilities for obtaining motor car supplies. It is a singular attribute of the aldermanic mind that considerations of friendship, or imagined humane endeavour, should allow such a wrong against good sense and the general public traffic welfare as an isolated petrol pump on the edge of the street pavement. I have exhibited a slide showing the simple and effective manner in which our American friends have overcome this difficulty.

On the aesthetic side of roadmaking, I can best indicate with the aid of some Californian photos, some of the more recent means of beautifying roads and suburban allotments; I wish to draw your special attention to the fact that efficient lighting of suburban streets, having avenues of trees, is only possible with expensive systems of many lamps, but it was noticeable that many of the best effects in the direction of street improvement are obtained by green lawns and shrubs which do not, of course, materially interfere with reasonably economical lighting. Good lighting at night, even in warm climates, is preferable to poor lighting or expensive lighting if trees are used, and a few square yards of green lawn or garden will suffice to undo the raw ugliness of an asphalted road, and may even, with care, improve the traffic conditions. On the subject of roadmaking, so much has been written in praise of the truly ideal American road, that one is apt to overlook the fact that in Great Britain and on the Continent it is rarely that one meets, while motoring, the kind of dump that appears to be purely Australian. But our problem is, of course, infinitely more complex than elsewhere, owing to our distances, lack of population and high cost of roadmaking and repairs.

A good concrete road, suitable for heavy traffic, has, up till recently, cost in New South Wales approximately £1 per square yard, or for a 15-ft. wide roadway, £8,800 per mile, a very heavy burden for our spread-out population; and even concrete roads require constant maintenance.

The New Main Roads Board will, of course, be fully seized with the advantages of the American labour-saving devices for this purpose, so that any constructive suggestions which I might make as a result of my observations in the U.S.A. would hardly be appreciated by that doubtlessly expert body. May I, however, take the liberty of suggesting that the purchase of a stock of suitable machines for this purpose, and which could be hired by each authority as required, would be a mutually advantageous proceeding. Judging from results, however, I do not think that one could go very far wrong if the road designs and specifications by Mr. O'Shaunessey, Chief Engineer, San Francisco, were adopted in toto.

In the above comments, which, for lack of time, I have had to gather together hurriedly, I have not endeavoured to cover the points in Town Planning with which the text books already deal most fully, but I have tried to convey to you a few of the points which most vividly struck my imagination as directly bearing on our rather unique Australian conditions. I trust that you will receive them in the spirit in which they are given; namely, the desire to add to the comfort, cleanliness and efficiency of our naturally beautiful surroundings.

THE CHAIRMAN said that one outstanding feature of lecturer was the vision displayed by Mr. Myers. During the last few weeks, he with many other people, had been engaged in a good deal of strenuous campaigning, and he thought if there was one feature which was wanting on the part of many of their public men, it was vision. He had used one illustration frequently during the past few weeks. Among the men of the past who had held prominent positions in the State there was one who would be remembered 100 years hence. He referred to Sir Henry Parkes. He (the speaker) had been referring to the growth of Sydney. He asked how many folk realised the provision that had been made central, north and south, for the lungs of the city. A man lived some years ago who did realise what this city would be in 100 years. On the North, he dedicated Kuringai-Chase. He supposed none of them had seen anything finer than the views obtainable there. On the South another area of the same extent, 33,000 acres, was reserved. How few had taken the trouble to go through National Park—it was hardly touched as yet.

In the centre of Sydney, what was more or less a desolate, wind-swept area, had been reclaimed, and to-day there was Centennial Park, with all its beauty. Those three areas were due to the foresight of one man, Sir Henry Parkes. In years to come Parkes' name would be remembered with affection by the people of this State.

The speaker had tried to stress the importance of forestry on the public men of the State. They could not get public men to look ahead five minutes, and as for expecting a Minister to provide an annual sum to insure that the timber reserves be protected, it was out of the question, for the simple reason that there was no return in it, and no profit. He had asked Mr. Chaffey if he would consider an amendment of one of the Acts, making it compulsory on the part of landowners to plant a certain number of Kurrajong trees, partly for beauty and partly for fodder, but nothing was done. Vision as far as public men in Sydney were concerned was unknown. He agreed with the lecturer that the reason was their cursed political system, which had permeated municipal life to-day, and owing to which they could not get continuity of policy. He referred to Port Kembla and its great growth and developments. Recently Parliament had approved of the construction of the line from Moss Vale to Kembla to give facilities for the steel industry, and with the advent of the railway Mr. Hoskins was establishing a new industry. They could not get a Government to realise that it was time to re-design Port Kembla. He had pleaded with the Local Government Department to do this. In another 50 years he held the view that Kembla would be another Newcastle. What harm would be done if the Government resumed land now—they could sell it back. The improvement in the City of Sydney was haphazard—a hand-to-mouth sort of thing. When he was in the Sydney Council, it was a tragedy that when certain things were proposed, they perhaps did a certain section, and then in a few years they found they were hit up by increased values due to their own creation. The sooner there is a representative body in this city of responsible, qualified men in all walks of life who would give their services gratuitously, so long as they are free of control, the better. He had appreciated the address that had been given by Mr. Myers, and he again stressed the need there was of vision. The more they got professional men, engineers, builders, surveyors, artists, to take their full share of public life, the sooner they would have a city worthy of those who live in it.

MR. WATERHOUSE moved a vote of thanks to the lecturer.

PROFESSOR WILKINSON seconded the motion.

MR. MUNNINGS had much pleasure in adding his quota to the vote of thanks.

DR. PURDY thanked the members for the opportunity he had had of having this intellectual treat. He had been much impressed with Mr. Myers' lecture, and also with the remarks of Sir Charles Rosenthal with regard to vision. It was quite an easy matter to calculate the future population of any city. Dr. Bradfield had estimated by a mathematical formula in 1911 what the population would be in 1920, and he was only nine short. They had calculated what the population would be in 1950—2,990,000. So that the remarks of Sir Charles were absolutely justified, that they must plan ahead. They should have by that time 100 gallons of water per capita, so that by 1975, if the population increased to 4,000,000, they would have at least 50 gallons per capita. The same with regard to roads and parks. It was up to them in the near future to start a campaign, and impress upon the public that they were living in the 25th year of the 20th century, and that they must wake up and realise they had a modern city. They must make provision for 2½ millions of people within the next 25 years.

MR. ANDERSON also supported the vote of thanks.

SPECIAL GENERAL MEETING

23rd JUNE

There were 18 members present. Apologies were received from Professor L. Wilkinson, Messrs. A. W. Anderson, and B. J. Waterhouse.

The President, Sir Charles Rosenthal, stated that they had met together to confirm the resolution amending the Articles of Association passed on the 2nd June.

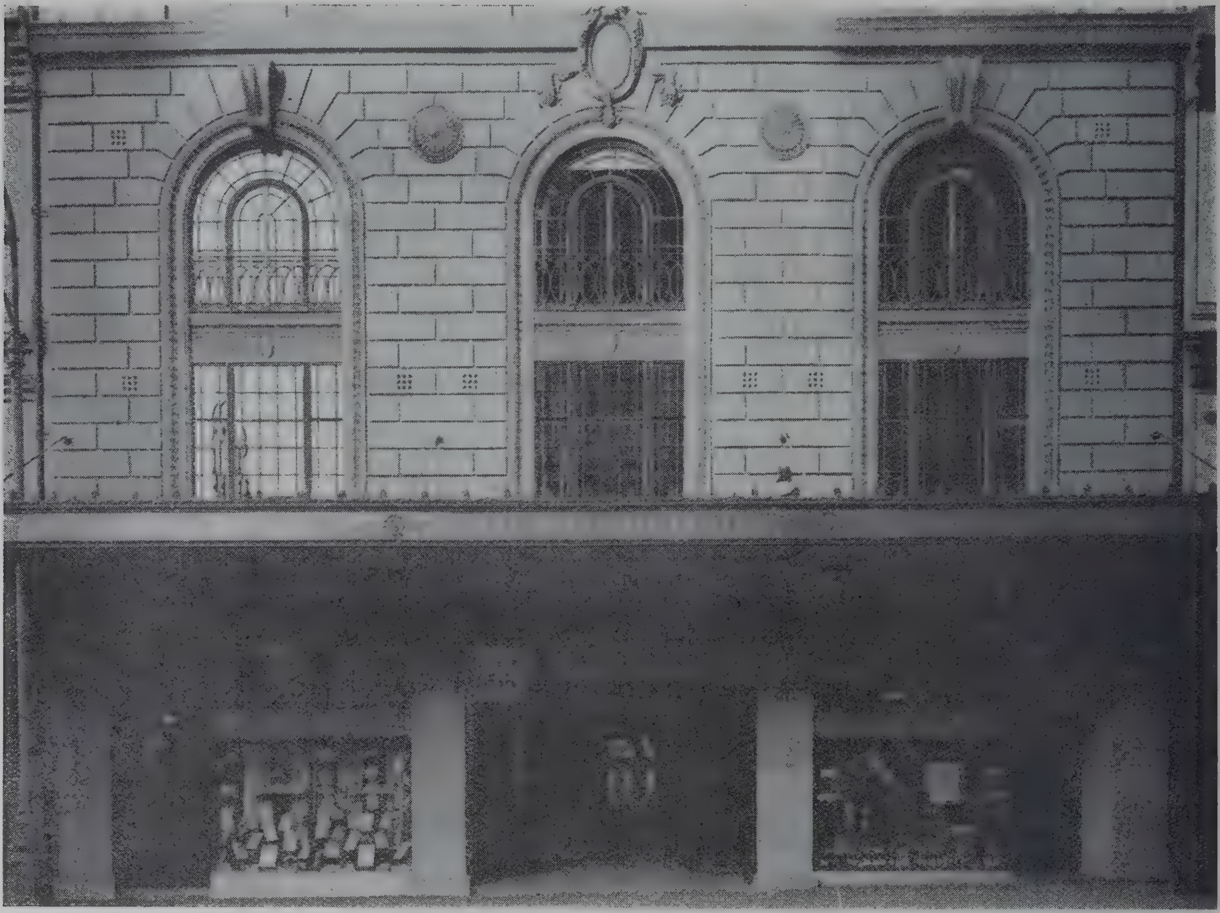
MR. PEDDLE moved that the resolution amending the Articles of Association, passed at the special meeting held on the 2nd June, be, and is hereby confirmed.

Seconded by Col. Hurst, and carried unanimously.

The confirmation of the second resolution was moved by Mr. Peddle, seconded by Mr. W. De Putron, and carried.

NOTICE TO ARCHITECTS.

The article "Heraldry in Architecture" will appear in the August issue of "Architecture."



ENTRANCE, NATIONAL BUILDING, PITT STREET, SYDNEY.

THE DETAIL OF THE LOWER PART OF PITT STREET FRONT. ARCHITECTS: JOSELAND & GILLING.

ARCHITECTS' ANNUAL EXHIBITION

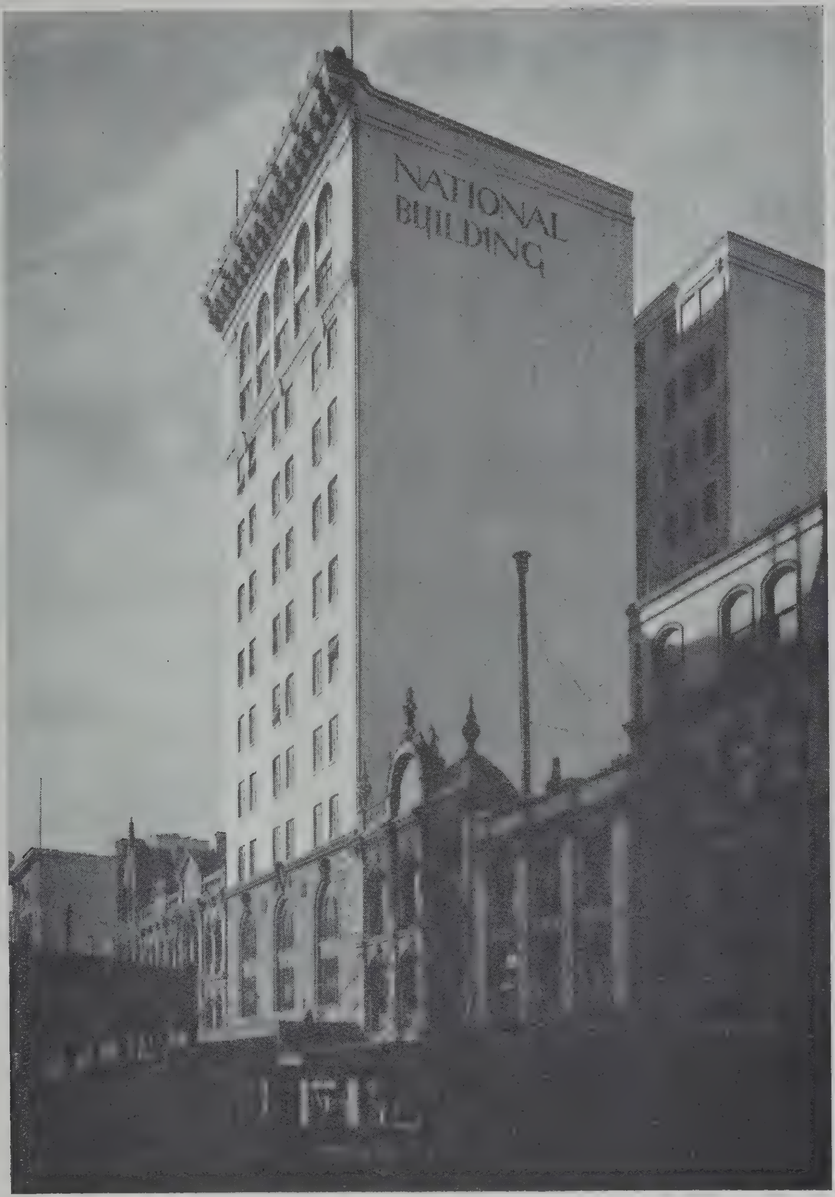
JUNE 10th, 1925

THE Annual Exhibition of the Institute was held at the Department of Education from the 10th to the 27th June. The Exhibition was opened by Lady De Chair, whose remarks are well worthy of record:—

Ladies and Gentlemen:

"It strikes me, not only as a pleasure, but really as a great privilege, to open this Exhibition of Architecture. Its scope is so far-reaching. The fact that you are here means that you are interested in improving the conditions of Architecture, and interested in the subject also. I have been here over a year now, and love Australia, and especially Sydney. I see the possibilities of your country, perhaps more than a great many of you do. I have been in so many of the Dominions, and I do agree with your President that Sydney compares favourably with any other city in the world—quite apart from the wonderful beauty of its surroundings.

With regard to its domestic architecture, you have here in your midst architectural value for your money. The designs are thought out with the greatest care, and apparently with regard to climatic conditions. If I may be permitted to say so, why on earth do you have nothing but bungalows? A double-storeyed house does save labour for the women. I hope there are lots of women architects in this country; I don't know any personally. Of course, with your architects, when a client asks to have a house built, the first thing is to see that all waste space, as far as possible, is eliminated, and that is where the woman comes in, I think. Of course, in the dim past a genius like Michael



NATIONAL BUILDING

National Building, in Pitt Street, was erected for the Scottish-Australian Investment Co. Ltd.

The building is fire-proof, constructed of reinforced concrete, carried to the maximum height permissible in Sydney, and contains 13 storeys. The basement is let as a cafe, and the ground floor comprises two shops—one of which is Garvey's Wine Bar. The building was erected while this latter tenant had practically undisturbed occupancy.

A feature has been made of the Entrance Vestibule and Elevator Lobby, which is finished in "stuc" with white joints.

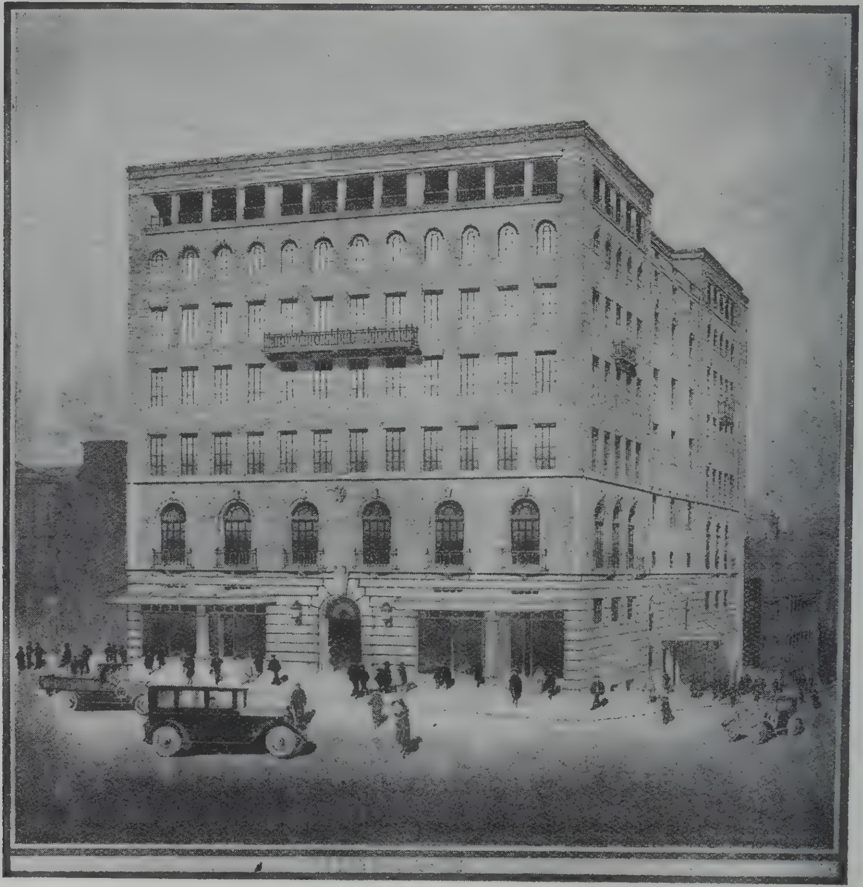
All internal finishings where wood are of maple, all ironwork, internal and external (including awning), is painted white.

The ground floor to Pitt Street is of unpolished grey granite, and the top of the first floor is faced with Pyrmont stone, the upper storeys are cemented and coloured a deep cream.

The building contains every moderrn convenience and up-to-date appliances.

Architects, Messrs. Joseland & Gilling.

Contractors, Messrs. Beat Bros. Ltd.



Y.W.C.A. BUILDING. PERSPECTIVE VIEW.
Architects: Waterhouse & Lake.

Angelo has outshone his competitors, not only architecturally, but as an artist, and so gave a higher tone to everything, and so it is to-day.

In South African architecture everything has been put on a greater footing, and reconstructed and developed, just as in earlier days this was done by the great veterans of art in Italy. Architecture, in a sense, expresses the mentality of a country to an astounding extent. In the past your people built beautiful places like Camden Park, the Mitchell Library, Government House, the Gaol at Berrima, and many other fine types of architecture, because they were used to such homes and structures. They had to labour under great difficulties of transport, distance and so forth, but they were determined to develop this wonderful country of yours on the right lines. I have noticed wonderful buildings all round Parramatta and places like that, some of these are shown in Hardy Wilson's wonderful book, which he has just brought out.

If you hear anyone complaining about some of your towns being joyless and ugly, tell them the remedy is to start planting trees and flowering shrubs, and to discard the hideous colours and meretricious ornamentations, even if their predecessors recently admired them. I feel strongly about that. I feel that generally there is not enough love of the beauty that creeping plants or trees can bring. If we can't all have a stone house or a brick house, paint the wooden ones a decent non-poisonous looking colour. I didn't like the colour of the roof at "Hillview," so your Government has now painted it a very soothing colour of green. If we could induce people who have not had very much training, to do away with ornaments on their homes, it would be a step in the right direction.

I have a tremendous affection for those people who are trying to plant gardens up-country way, with creepers round their houses. I think it gives a sense of mellowness to the places they live in, and some of their neighbours might take hints from them. I should like to meet some of those unknown warriors —I am sure they are women.

Town planning seems to me a vital need, and not a luxury, and there should be architects who have training on every committee which has to do with the planning of a town. I think there should be town-planning committees established in every town in New South Wales. In England not even a shed can be built now without passing the censors. I have had to go through all sorts of formalities before I could get even trifling things done.

In parts of America they are getting perfectly amazing results through estate agents and retail merchants combining with the architects, and forming committees to start campaigns for beautifying a city, window boxes, cherry trees and shrubs figuring largely. The history of a country is invariably written in stone, and sometimes in iron and wood. A clever artist and a woman advisor seem to me to be vital needs in all architects' offices. I have done a good deal of building, as my father did before me, but I consider his houses were thoroughly uncomfortable—not enough cupboard space, and so on, although built to really beautiful designs. I used to say he had no sense at all as far as women's requirements in a house were concerned.

Your excellent up-to-date architects can cultivate the needed art sense in a nation, if you will allow them to, and an exhibition like this should be studied by every country town, as well as by you fortunate city residents, who have these frequent chances of seeing how to build for durability and beauty, as well as to the best advantage economically. The model village on exhibition here is excellent, and I should like it carried bodily to at least six places I could name.

I think that sometimes the expensive labour conditions in this country are going to prove an advantage, for these conditions are going to make it necessary for people to eliminate hopelessly ugly and useless ornamentations. A good architect considers that sham ornaments simply ruin a home, just as their equivalents are avoided by a first-rate tailor.

As the public puts up memorials and so on, it should realise that those which express grace and grandeur are much more likely to become world famous than any number of copies of pagan memorials or designs. There are one or two magnificent things out here; your Shaft of Light and Silence at Albury, from what I hear, is very well worth while studying; the wonderful memorial avenue at Perth in W.A. will be a perfectly superb feature in time to come. Then there is the grand and useful but simple MacKinley Memorial in U.S.A. All these things strike me as being worth more than all the costly ugliness of the famous Leipzig Memorial put together.

If you employ an architect of any merit, do give him a square deal by being humble enough to listen to his advice regarding layout of gardens. I am often told that beautiful homes have been spoiled by the poor design of the gardens. I think too an architect should be consulted regarding colour schemes to harmonise with furnishings, and so on. Every country cannot have an Angelo, a Lutyens and a Baker, but you have some very experienced architects who are bound to help the nation in time. I am glad to see that people are realising that simplicity means real beauty in their homes, because there is a tremendous feeling for beauty and simplicity displayed now by people whom we might say were quite uneducated a few years ago, but who are really striving to cultivate simple tastes in domestic architecture.

If you have historic buildings that are likely to be demolished by unthinking people, fight for their restoration as part of your inheritance. Your country's past is one of splendid achievement against great difficulties of transport and distances, and I see a wonderful future, if wise guidance is taken and given. Here in your perfectly exquisite Sydney I see many charming houses of a kind superior in comfort to those so much admired in Italy and France, and I do so want them in country towns also. If you know of any millionaire who is longing to know what to do with his money, just refer him to me. When I see an ugly house, my heart goes out to it, and I long to make it pleasanter.

In this beautiful Sydney of yours I long to go inside some of the houses and see what they are like, and how they are furnished. I can see a tremendous opening for architecture in the country towns. Criticising towns—I think, considering the difficulties people have, it is amazing that they have so much comfort really, but there are more beautiful designs and materials they could adopt. I do not mean to say that everybody can have these homes, but wealthy people who really might spend their money in home building. The home sense is strongly developed in England, and I think it ought to obtain in the Dominions. I do think that the sense of home ought to be encouraged.

I have said far too much, but I do feel very pleased to have had this chance of looking round and benefiting as I have."

A vote of thanks was proposed by Professor Wilkinson, and seconded by Mr. B. J. Waterhouse.

Record attendances were a feature of the Exhibition.

Sir Dudley De Chair, Lord Stradbroke, Mr. A. K. Henderson (retiring Federal President) and delegates to the Federal Council Conference, and a party of Master Builders, were among the visitors. The attendance on the opening day was splendid and the conversazione proved to be a pleasant reunion.

THE EXHIBITS.

The response from Architects, although numerically smaller than 1924, certainly maintained a high standard of work, but it must be regretted that many important firms did not contribute works, which in a measure reduced the representative character of the exhibition. Indifference to the importance of the occasion is unpardonable, as the Council is most anxious that all Architects should submit work, so that the public may see the very best collection of the year's work.

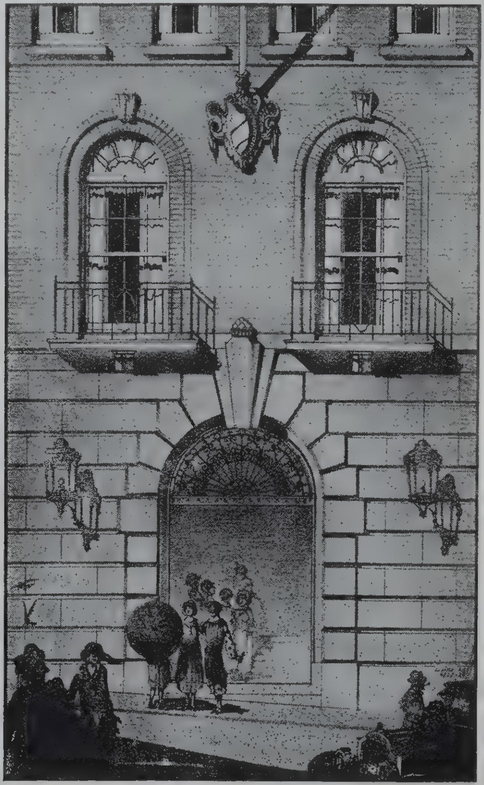
If the determination to hold aloof is due to a difference of opinion as to the work of the Selection Committee, it is the duty of members to make such representation to the Council. The effort of the Council is to make the Exhibition of educational value to the public, and every architect should endorse such a policy by the submission of drawings. It is gratifying to record the excellence of the work exhibited, the general level of design, and draughtmanship, being perhaps the highest yet exhibited. The absence of the sensational rendering which has all too frequently spoilt the display is encouraging. Such work misleads the public, creates a false standard of draughtmanship, and provides a pernicious example for students to emulate.

The students' work from the University and Technical College was of a very high standard.

In the Public Buildings Section many excellent designs were shown, and the Domestic Section demonstrated the great improvement taking place in the important branch of an Architect's work. More plans in this section would increase interest from the point of view of the public, but Architects seem reluctant to exhibit these very interesting details of the domestic work.

The exhibit of books from the Public Library proved of great interest to members and visitors. We record our appreciation of the help Mr. Ifould is always so ready to render in this direction.

The exhibits of F. E. De Groot, and Anthony Hordern's, and also the model village added greatly to the general interest of this year's Exhibition which, from every point of view may be described as a success.



ENTRANCE OF Y.W.C.A. BUILDING.
Architects: Waterhouse & Lake.

ENGINEERING SECTION
CONDUCTED BY "BUTTRESS"

STEEL OR CONCRETE—WHICH?

IN Sydney to-day it has become an almost established structural fact that if a skeleton frame is required it must be of reinforced concrete in preference to structural steel. How has this idea come about? Is one any better suited for the purpose than the other, or is it cost that counts?

This brief review of the advantages, etc., of each material may enlighten us as to the reasons for our adoption of one definite material for a frame for buildings of any height in preference to the other. Consider the position in Sydney in pre-war days. Whenever a building of any height was designed, structural steel was mostly used for the construction of the actual skeleton. Foundations were invariably of steel grillages, and not of the reinforced concrete type, and a steel section handbook was one of the most important reference books in an Architect's office. To-day things are changed, the architect hardly ever opens a book of the properties of rolled steel sections—he does it in concrete, and thus the very smallest structural problems leave his office for that of the concrete engineer.

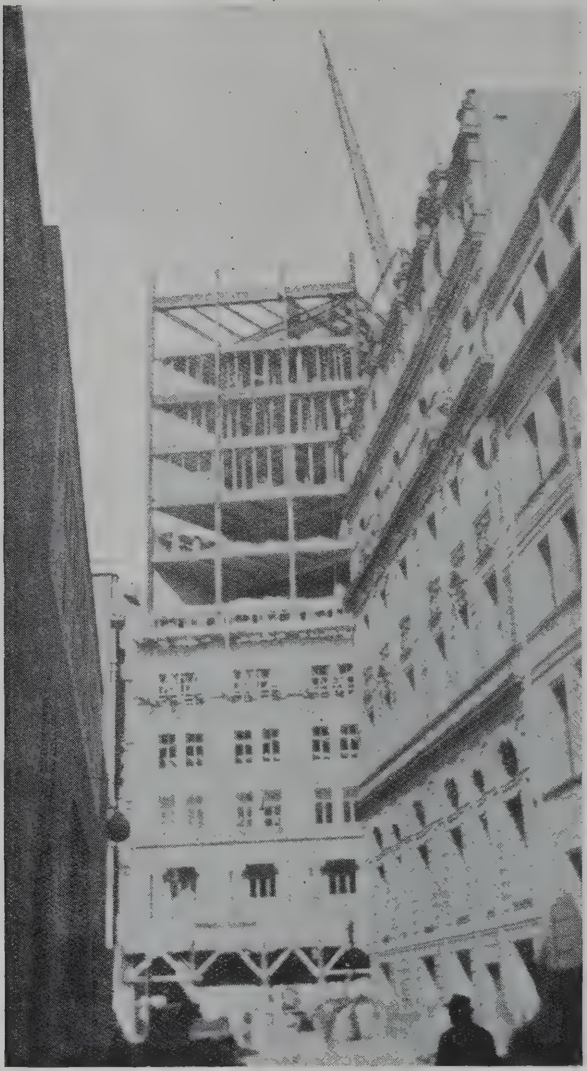
Why has the order of things changed? So many things have changed in recent years owing to the late war, and structural design has been amongst their number in the city. Not only has that war changed our methods, but it has changed our ideas and made us the servants of habit, for during the war years we found the importation of steel sections from Great Britain very intermittent, delays occurred which would have meant heavy expense to owners engaged in building operations, so we resorted to the use of a product that could be readily obtained locally, and thus reinforced concrete came rapidly to the fore, and we have carried on with ideas founded on these circumstances to a very great extent.

The war years have passed, and we did not return to the old ways, firstly because the majority of structural steel sections have to be imported, owing to our own supply from the Newcastle Steel Works hardly furnishing enough sections to enable us to build in structural steel to an economical advantage. This state of affairs has thus made structural steel more costly than it ought to be, and it is this question of cost that enters into all considerations as to which it is to be for the frame—steel or concrete? All agree structural steel is at a high price, and being almost the same as that of reinforcing steel does not cause the most advantageous conditions for its use, but structural steel can be made to have a very direct and favourable position alongside that of reinforced concrete, when it comes to extra cost giving extra advantages.

Many enthusiasts of reinforced concrete in this city lead us into the arena with dazzled eyes on this question, and the poor old structural steel takes second place, because we do not remember its very decided advantages which, after all, are worth the little extra cost, and have not arguments in its favour to jamb up hard against the enthusiasts of a material that once served a very useful purpose, but which has thrown us into a rut which will further hinder us in solving freely our office problems. There was a time when all architects knew something about their skeleton construction, now they know very little, for the complexity of calculations that they feel are being whirled around them, producing a discrete beam instead of a homogeneous beam or girder that they could gaze at and feel sure of its value, are too much for them. Unfortunately does this state of affairs exist, and architects have been led into this chasm by their own apathy to most matters that appear in building operations to be of an engineering nature.

Reinforced concrete is an admirable material, and has many advantages, but if the advantages that it has when placed before us cause us to forget the other advantageous methods of construction, as it has to an extent in this city in large buildings, our observations have done us more harm than good. Cost and again cost are always presented to us as the slogans of the rivals of one material against another, but advantages often outweigh cost.

Before deciding in favour of either form of construction let us summarise the benefits derived from either construction, and let costs follow in their wake. First consider the case of a multi-storeyed building in the city, and the advantages and disadvantages attendant during a frame of reinforced concrete construction. Concrete consists of a plastic material surrounding an arrangement of steel rods, the whole giving an armoured or reinforced concrete which is assembled on the job during building operations, whereas a construction of structural steel is a factory-made product of standardised parts assembled in place, according to the markings on each individual piece.



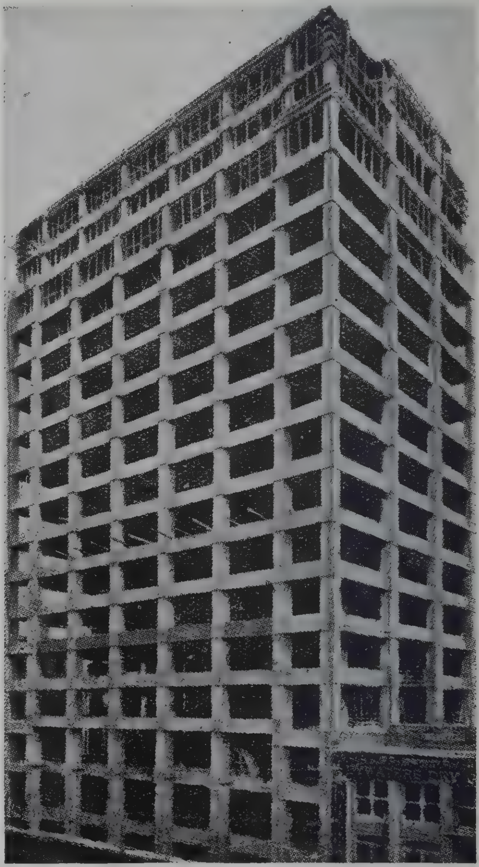
A STEEL FRAMED BUILDING—SYDNEY.
THE NEW BANK OF N.S.W., MACQUARIE PLACE.

The direct advantages to be gained by the use of reinforced concrete to-day, as outlined by our advisers are, it is better suited to fireproof conditions, is easily manufactured on the building site, and its flexibility allow alterations to be rapidly made, and mistakes to be easily remedied (!) and finally the cost of the steel and reinforced concrete combined is less than with structural steel.

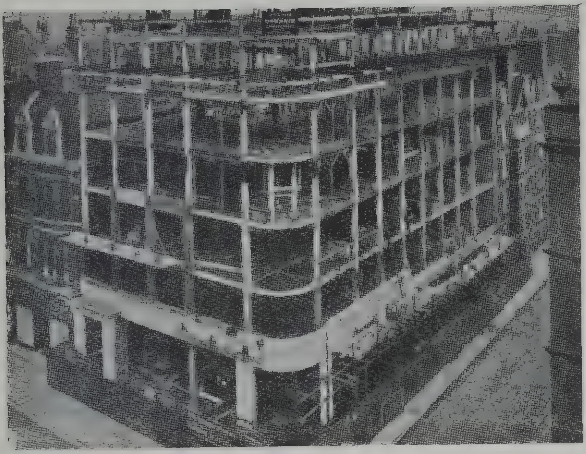
The disadvantages appear on analysis to outweigh the advantages except in special cases where undoubtedly reinforced concrete is superior to structural steel. But after all, each is a material, and naturally there are occasions and parts of structures where Reinforced Concrete is far better suited to the case than structural steel, as in the galleries of assembly halls, staircases, etc., and most adjuncts to a building of any magnitude, but in the example under consideration only the main frame is being considered, not the secondary construction.

Structural steel construction in Sydney has really shown architects and engineers that reinforced concrete certainly has some disadvantages, when we see in our streets in almost all buildings structural steel construction forming the lower storeys, and reinforced concrete the upper. This fact in itself places one disadvantage before us—the bulkiness of concrete columns.

Area is lost in floor space and thus money again, the greater bulk causes more timber to be used in formwork, an added cost. Greater dead load occurs causing heavier sizes of members, and in office buildings with comparatively light loads the economy in concrete framing is false, and in long spans concrete framing is expensive. The greater uneconomical design in reinforced concrete will bring greater expense to an owner than uneconomical steel design, for in a construction of two parts,



A CONCRETE FRAMED BUILDING—U.S.A.



A STEEL FRAMED BUILDING—LONDON.

steel rods and concrete—the decrease in one part, say the steel rods causes much heavier cost due to a larger part of concrete being required, giving a heavier dead load, and more of the most expensive portion of the combined materials.

The articulation of structural steel and reinforced concrete where the former is used in lower storeys is an added cost, requiring special provisions for the joining up of the two forms of construction, and it appears to be best to carry on in the one material.

The recent failure in Melbourne has borne out these remarks concerning concrete, and shown the attendant risks with a material not given thirough supervision. This essential as enumerated in our section of "Concrete Construction Observances" of the last issue that supervision be strict; unskilled labour for the most part is used, and as evidence has shown, divergence from original design is easily made with a material that depends entirely upon the human element. Structural steel being a factory product of skilled craftsmen gives a construction that can be easily supervised, and the advantages from the point of view of bulk and dead load are obvious. With good plain concrete casing fireproofness can be obtained, and as regards speed of erection, it can progress ahead of reinforced concrete construction, provided the organisation of the steel erectors is good as stancheons, and beams can be quickly riveted together, and the floor framing covered with reinforced concrete panels which here serve their most favourable purpose. Supports to each floor may be placed on the line of steel framing below or hung from saddles on the steel beams, thus rapidly allowing construction to proceed, and not requiring a period of initial setting before being subjected to loads, as is the case with reinforced concrete—also wet weather conditions do not effect construction so much. Headroom restrictions are more easily overcome with steel construction, and finally, as stated before inspection and check, as far easier made with this form of construction, incorrect disposition of the steel can be readily seen, as is not quickly covered up from view, as with concrete construction; connections can easily be checked, concrete requires this greatly, owing to the labour employed being unfamiliar with design, which depends for its economy and action upon the correct disposition of many parts.

And now we return to cost—the short word which often throws to the wind our ideas on a different construction. These few advantages of structural steel against reinforced concrete surely warrant the extra cost, and if analysed minutely would, despite the present extra cost, bring structural steel back to its former high position.

Greater use would probably lower the cost, administration of steel erection organisations would improve, and our own steel industry would be benefitted.

Both these materials serve a purpose, and it is a great pity that one causes us to dismiss the other almost from our minds—careful analysis of each is what is required, not a hurried check of sizes, for each small section brings factors of dead load, formwork, etc., into the analysis, and with the advantages to be gained, it appears a steel frame would in all probability make a better showing in our city than it does to-day.

Concrete and steel go hand in hand in the construction for floors, platforms, stairs, etc., the former is essential, but with narrow city sites it does seem obvious that a lighter structure can be more economical. With factories and low buildings in the industrial areas concrete will always win, where large voids in walls occur and little facing has to be done, and again where the monolithic property of concrete and its aesthetic treatment are required, it serves the best purpose. In high city buildings, steel has in most cases in the world led the way, it is lighter to handle at great heights, and where the building is a skeleton covered up by a flesh of another material, it undoubtedly is the best form of construction, and it is to be hoped that we architects of to-day will once more open up our section handbooks, and on a job know definitely in our own minds what can be expected of our construction.

HOLLOW BLOCK FLOORS

BY MALCOLM S. STANLEY, M.C., A.M.I.E.A.

THE growth of Hollow Block floors in Reinforced Concrete Constructions has grown rapidly during recent years. The scientific advance in Reinforced Concrete gives to Hollow Tile Work an especial place, and present-day practice must not be confused with the hollow block work of some years ago; at that time the tiles were of such a shape that when fitted or keyed together they would span across moderate openings, and once in position between girders, they act as a bridge to support the green concrete—that form of construction has fallen into disuse; it belongs to a period when the laws of Reinforced Concrete were not so well understood as they are to-day.

In modern work the tile functions as a mould and round it is cast the concrete. Once the concrete has matured the Hollow Block ceases to do further service, save that it has a flat soffit which supports the plaster finish. In other words, the intention of the Hollow Block is to create and give a predetermined shape to the moulded concrete, and that shape corresponds to maximum strength and rigidity and a minimum of waste material. The Hollow Block reduces the dead weight of the floor. The analogy is the same as is applied to Rolled Steel Sections. To use a minimum of steel, engineers designed the ordinary section R.S.J., in which the material of the flanges is joined by a thin web; it is a thoroughly economic section, i.e., one in which the material of which the joist is composed is distributed to secure a maximum of strength with a minimum quantity of material, and precisely the same laws apply to Hollow Tile Floors. The quantity of materials used is reduced without in any way interfering with the strength of the completed floor, and at the same time this is done with considerably reduced cost as against a solid type of concrete floor. Actual practice with Hollow Tile Floors show that they are lighter and cheaper than a solid concrete floor.

A number of factors together contribute to economical work with Hollow Tiles, and briefly enumerated they are——

1. Simple form work. Owing to the absence of girders the form work may be used in mill lengths—there is no cutting up of lumber on the job.

2. Less centering—owing to the fact that the soffit of the tile is capable of bridging across openings, the form work or sheeting may be reduced by 30 to 40 per cent. by openings, which are left in the sheeting across where the Hollow Tile forms a bridge.

3. The tomms are all of one length.

4. Owing to the lighter dead weight of the floor, the steel quantities are considerably reduced, as against the solid slab and girder type of construction. Further, the steel is laid on troughs between the Hollow Block, and is protected against displacement during concreting.

5 The tiles are rapidly and easily placed.

6. There is less concrete to mix, which means less material to cart to the site, less sand, and correspondingly less handling of materials about the work which, of course, contributes to greater speed of construction.

7. The Hollow Blocks are manufactured to meet all types of floors from domestic to heavy warehouse loads.

There are two types of Hollow Blocks—(1) "Single Way" Blocks and (2) "Double Way" Blocks.

The Single Way Block is giving way to Two Way Block construction. The single way block is one in which the reinforcement lies, and can only go in one direction, i.e., between main girders and spans of 25in. are common. They eliminate secondary beams altogether and when used have many distinct advantages over solid floors, and also some disadvantages. The writer has used them extensively. The girders, where necessary, are usually heavy and deep, and the construction efficiency of a single way Hollow Block floor from points of view of cost is a debatable question. Again, in actual practice, the single way tile floor is only capable of transmitting the stresses one way, i.e., in the same direction as the lay of the steel. This makes an extremely weak floor in direction at right angles to the line of the ribs. On the Sydney market there is a Two Way Innes-Bell Hollow Block, especially designed for concrete floors. These blocks frequently eliminate girders altogether, and have a far wider adaptability than the Single Way Block. The Two Way Blocks are laid out symmetrically on the sheeting forms in such a way as to enable the steel to be placed on troughs between them in two directions at right angles to each other. This gives adequate transverse strength. The construction has been expressly designed to meet Australian conditions, and the floor created is cellular in type, i.e., one which has the greatest strength with the least dead weight. Owing to the two way reinforcement this Hollow Block Floor is capable of carrying the heaviest of loads with remarkable ease, and its theory is consistent with the most modern practice in concrete. The floor is really a series of reinforced ribs of concrete, running at right angles with a sheet of concrete resting on them; the thickness of the concrete slab resting on the ribs is controlled by the conditions of service—that is to say, a warehouse floor would require a thicker slab than a domestic floor.

A study of concrete progress indicates that the girderless floor is the peculiar perquisite of Concrete Construction. Timber and steel buildings require the use of girders for economic construction. It would be impossible to build without them, but Reinforced Concrete, after following along the lines of steel and timber types for years, is now developing quite a new type, in which girders are not essential. The construction is natural to its physical properties, and one in which it exhibits its supreme merits. Two Way Hollow Tiles are designed primarily to conform to this new form of construction, and their use is consistent with good practice. They bring the standard of concrete work in Australia to the highest grade, and constructions are now under way in Sydney, which will compare in standard with any in any part of the world. For Garage Work, the use of mushroom floors with two way Hollow Blocks is unlimited, and large clear spans are possible which, without hollow tiles, would be impracticable. Hollow Blocks correctly applied take the cost out of concrete, and in some cases will compete with composite timber and steel floors.

So far as finish of ceilings is concerned, the soffit is a plain surface, and may be treated by precisely the same methods as apply to ordinary concrete ceilings.

Among a number of works the outstanding Sydney example of the mushroom floor with Two Way Hollow Tile Inserts is to be seen at Brandt's building, Woolloomooloo, now used by the "Sun" Newspaper Co. Here the spans are 27ft. 6in. centres, and the floor is free from projecting girders. The lighting, as a result, is remarkably good, and well worth the investigation of architects and others.

THE PAINT PROTECTION OF STEEL

CORROSION OF STEEL.—If iron or steel construction is left exposed to the atmosphere it unites with oxygen and water to form rust. Rust is a hydrated oxide of iron, and forms a porous coating on the surface of the metal that acts as a carrier of oxygen and moisture, thus promoting the action of corrosion.

If nothing is done to prevent or retard the corrosion of the steel in modern framed structures, especially in those of the mill building types as used in industrial operations, the metal rapidly rusts away, and the structure is short lived.

The corrosion of the steel in a structure may be prevented or retarded by covering it with a coating that is not affected by the corroding agents. The most common methods of protecting a structure are by means of a coating of paint or cement wash, the latter being most frequently resorted to when the steel frame is to be embedded in concrete.

Occasions, however, occur when even in a steel-framed structure the steel can be affected by corrosion, especially in outside columns to struts and light areas where only a light concrete casing for fireproofing is made. In such cases adequate provision should be made for protection, especially where large built-up girders are seated on top of these outside columns and are likely to be attacked by moisture. A thin coating of Portland Cement is effective in preventing rust, but it must be dense and very wet, and applied to a perfectly clean surface.

There is quite a difference of opinion as to whether steel should be painted before being embedded in the concrete casing of a steel-framed structure. But it so frequently happens that the steel is not embedded at once, and remains exposed for a long elastic, and to as great a degree as possible it it appears necessary to paint the steelwork with cement wash or a rust-resisting paint.

PAINTS.—Some specifications call for Red Lead, Graphite in Linseed Oil, or other methods of paint protection.

Paint used for structural steel should be tough and period before casing is put around it. In such cases should be waterproof. Less than two coats should never be applied, and these should be made on a perfectly clean surface.

Paint is always thin on edges and angles, and, therefore, it is good practice after the first full coat to apply a coat covering the angles and edges and the surface for at least 1 inch back from the edges, and covering all bolt-heads and rivet-heads. After the striping coat has become dry, the second full coat is applied, and it may then be assumed that the whole surface has received two full coats. Preferably a week should elapse between coats.

In designing the steelwork, all cavities, which may be filled with rain during erection, should be properly drained, and during erection all small cavities should be filled with cement, and all contract surfaces thickly painted. As regards the best paints for steel, it is preferable to use finely-ground graphite in linseed oil, or a make of waterproof paint—such as "Tocolith" or "R.I.W." Red lead is not very satisfactory, and rapidly thickens when mixed with oil, and makes application difficult; also, the oil and lead form a bad soap, which is unstable.

Such paints as mentioned should have the second coat of a different colour to that of the first put on in the fabricating shops to allow easy detection of the application of the second coat.

It is usual to estimate about 400 sq. feet to the gallon for one coat, although makers of these waterproof paints recommend 500 to 700 sq. feet. "Tocolith" is of grey colour, and forms perhaps the best priming coat for structural steel, and can be applied in the shops and "R.I.W." put on as a secondary coat, giving a black or maroon colour.

The U.S.A. steel-framed structures are usually given two coat work, and it has been agreed by structural engineers in that country that a steel building frame should be waterproof painted, although embedded in concrete, to resist the alkalis in the concrete and due to the fact that steel frames usually stand exposed for some time before being dressed with brick or masonry.

BOOK REVIEWS

REVIEW OF ENGINEERING BOOKS AND PERIODICALS.

1.—*Tables of Reinforced Concrete Floors and Roofs.*

(R. Travers Morgan—Chapman & Hall Publication.)

This collection of tables recently published by Messrs. Chapman & Hall, the well-known London publishers, places before architects and engineers a well-compiled list of slabs for various loadings.

The tables are preceded by a foreword by E. Fiander Etchells, Esq., the Past-President of the Institute of Structural Engineers and an engineer well known to architects in London as an officer in the London County Council. His foreword contains a few notes on the standard notation of engineering formulae and practical points arising during the actual execution of reinforced concrete work. A few of his remarks concerning execution are here worth noting:—

(1) The necessity of getting rid of all voids in the concrete.

(2) The necessity of using the correct amount of water—neither more nor less.

The tables are well arranged in three groups, according to the Bending Moments of $\frac{W1}{8}$ for Ends Free; $\frac{WL}{10}$ for End Bay Continuous slab and $\frac{WL}{12}$ for Centre Spans Continuous Slab. The superimposed loadings are from 50 lbs. per sq. foot to 500 lbs. per sq. foot for stresses of 16,000 lbs. per sq. inch for steel and 600 lbs. per sq. inch for concrete. Groupings are made for spans from 5 ft. to 16ft., and the diameters of bars and distance centre to centre are given for each case with an alternative size. The most economical spacing and size of bars are shown between heavy lines.

Generally the book is well produced, with three sections divided by blue pages to facilitate reference. Such a book as this ought to be in every architect's office, for it gives, according to standard British practice, as regards stresses, the properties of R.C. slabs for a wide range of spans, and will easily enable architects to run out their slab sizes and steel, especially in the cases of R.C. floor or roofs on steel members.

The foreword says the book will be useful to "Architects who desire readily available information as to standard designs and safe loads on floors—clerks of works for checking on a job, and others. As Mr. Etchells says: "The book will enable R.C. floor slabs to be planned as easily as a train journey is planned from a railway guide."

KAHNCRETE ENGINEERING.—No. 62, Vol. XII.

(From Trussed Concrete Steel Co., Sydney.)

The last issue of this well-produced bi-monthly, devoted to the Kahn system of reinforced concrete, is, as usual, illustrated with interesting articles and photos. of buildings using Kahn products. The Trussed Concrete Steel Co. Ltd., London, who publish the journal, have, as usual, included articles devoted to the aesthetic side of construction, which appeals so much to architects whom, as this issue says in the article "The Most Human Art," are needed "to preserve huge structures from a certain lack of good manners!"

The article on "Ugly Buildings," reprinted from the *Yorkshire Post,* forms a happy criticism.

There is an article on the "Development of English Architecture," and some excellent photos. of Clare College, Cambridge, which has recently added new buildings to its pile.

Such papers as "Kahncrete Engineering," produced by engineering organisations dealing in Reinforced Concrete Construction, show how important this construction is in the community and what an important part Concrete plays in the art of building.

THE STRUCTURAL ENGINEER.

(The Journal of the Institution of Structural Engineers.) The last number, Vol. III., No. 4, of this periodical contains much matter of interest to architects and structural engineers. The journal is sold at the price of one shilling in the U.K., and is well worthy of many subscriptions to those not members of the Institution.

The present issue, produced, as usual, on art paper, contains photos. and articles on "Housing in the Netherlands" by Sir Charles Ruthen, F.R.I.B.A., and numerous articles on problems relating to Architectural Engineering. For many months past a biography of Great Structural Engineers has been carried on by Mr. A. Trystan Edwards, A.R.B.A., the well-known architectural writer. The journal throughout may be classed amongst the most interesting of English journals of learned societies.

ARCHITECTURE

THE JOURNAL OF PROCEEDINGS OF THE INSTITUTE OF ARCHITECTS OF NEW SOUTH WALES

Vol. 14. No. 8.
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August, 1925

HERALDRY

ITS APPLICATION TO ARCHITECTURAL DECORATION

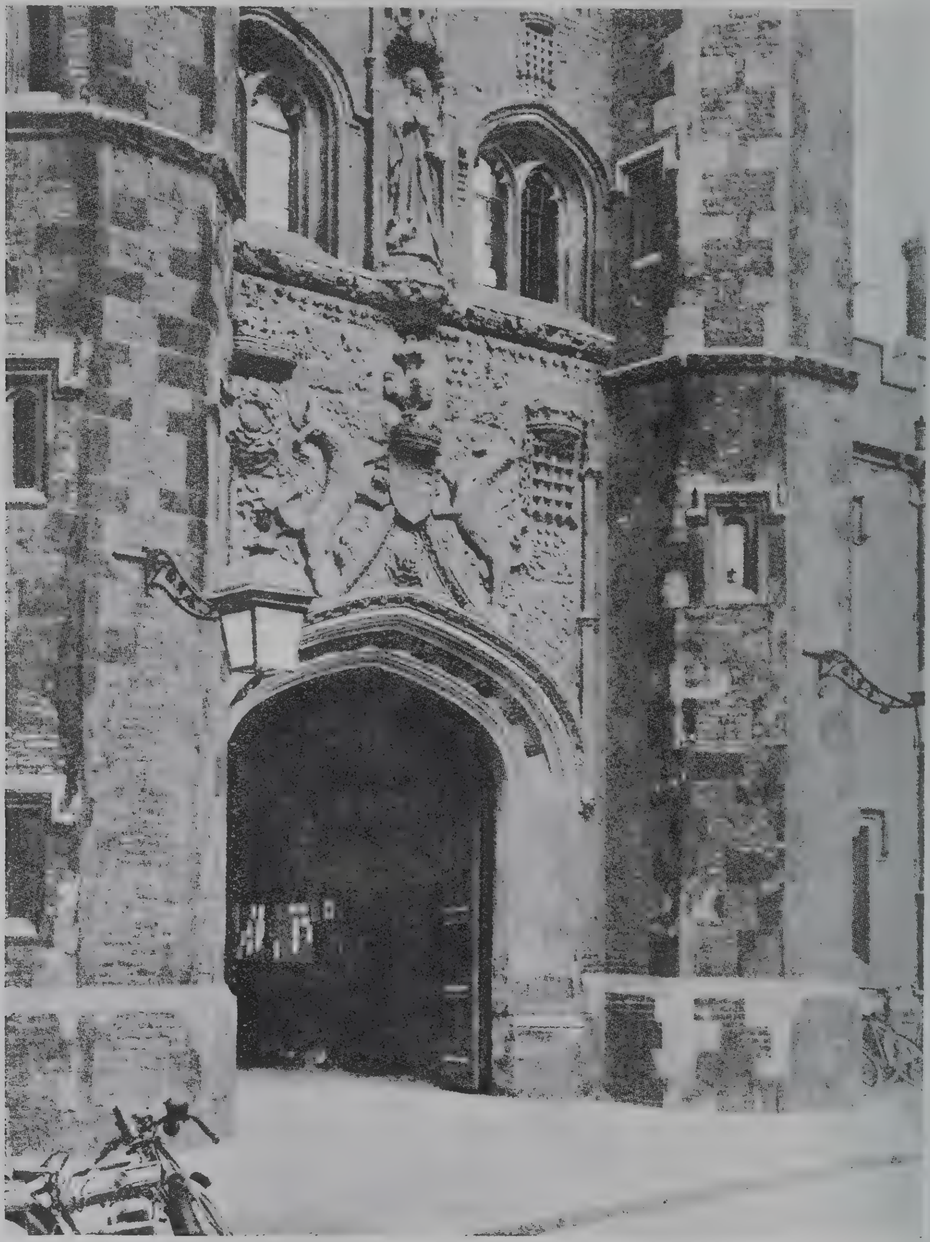
THE use of Heraldry as a means of decoration in buildings, either internally or externally, has not been greatly resorted to in Australia, except in the case of Public Buildings. This is most probably due to the fact that few families bearing arms have large homes where arms can be suitably borne in either timber or masonry, and few of our public institutions have had Arms granted to them. We have not the large estates where lodge gates can have on their piers heraldic ornament in the form of supporters surmounting shields and other heraldic arrangements that are met with in other parts of the world. There are very few companies possessing arms in this democratic land of ours, and our corporate bodies such as municipalities, shires, etc., possess no badges that can be displayed in the architecture of their buildings. A few Overseas Insurance companies have badges that are occasionally displayed over the entrance porches to their building, and the Government buildings and those of Capital City Councils have usually the Arms of the State or City on their facade.

Heraldry throughout the ages has always been an adjunct to Architecture, and it a pity that we have not in this country, had more opportunity of displaying it.

The public buildings of Sydney have in most cases the arms of the State of New South Wales portrayed on their front, and amongst these may be mentioned the Treasury, which has the Royal Arms and those of N.S.W. well carved in masonry on the facade to Macquarie Street, also the Public Library, with the arms of N.S.W. above the entrance porch, with the State's motto:—

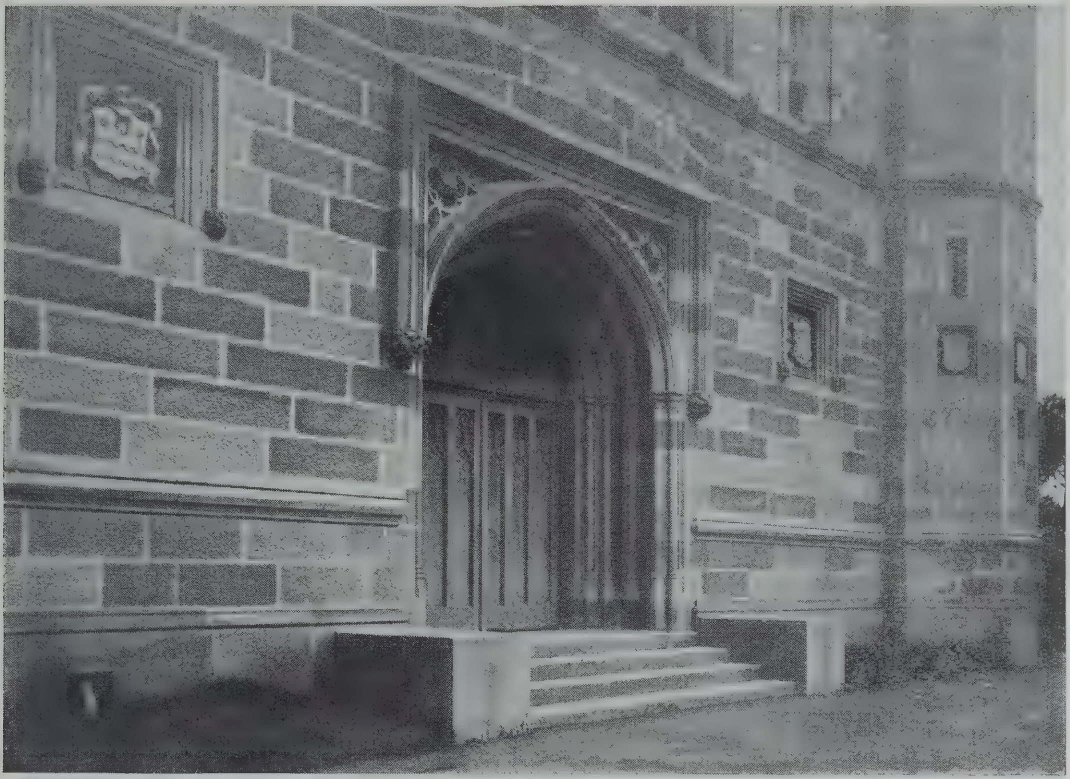
Orta Recens Quam Pura Nites.

Our Houses of Parliament and Law Courts possess none worthy of mention, but the City Town Hall bears the city's arms in the main pediment to George Street, high up above the street. This latter is well executed, but is unhappily wreathed with wire netting, due to the pigeons of this city, which appear to favour a shelter under the words of "I TAKE, BUT I SURRENDER." In most countries the late war has brought the execution of heraldic ornament into more prominence than in the few years preceding; particularly is this due to the regimental arms and crests of the fallen being displayed on memorials, both in masonry and timber, and perhaps more particularly stained glass. Stained glass is a medium well suited to heraldic ornament, and in Europe many fine examples are to be seen. Unfortunately, our own individual sections of units of the fighting services do not have a variety of badges which can be executed on our memorials, but in the Chapels of many of our Colleges there are stained glass examples of heraldry that are interesting to note, most being those of arms of men killed, or of the units in the Imperial and Australian Armies in which they served.



ENTRANCE GATEWAY, ST. JOHN'S COLLEGE, CAMBRIDGE.

THE ARMS OF THE FOUNDRESS ARE CARVED OVER THE ARCHWAY.



ENTRANCE TO THE GREAT HALL, UNIVERSITY OF SYDNEY.
SHEWING HERALDIC SHIELDS ON THE EAST WALL.

To-day in Australia perhaps it is to our Great Public Schools and Universities that we have to look for the execution of heraldry in Architecture, these institutions thus resembling more nearly the Old World institutions in this respect. The mention of the word heraldry conjures up before people the use of terms in a language almost foreign, and arranged in a manner that only archaeologists and philologists can decipher. Such ideas unfortunately retard an interest in a very delightful subject, of which we have few architectural examples, but which, nevertheless, are before our eyes if we only realised their presence and meaning.

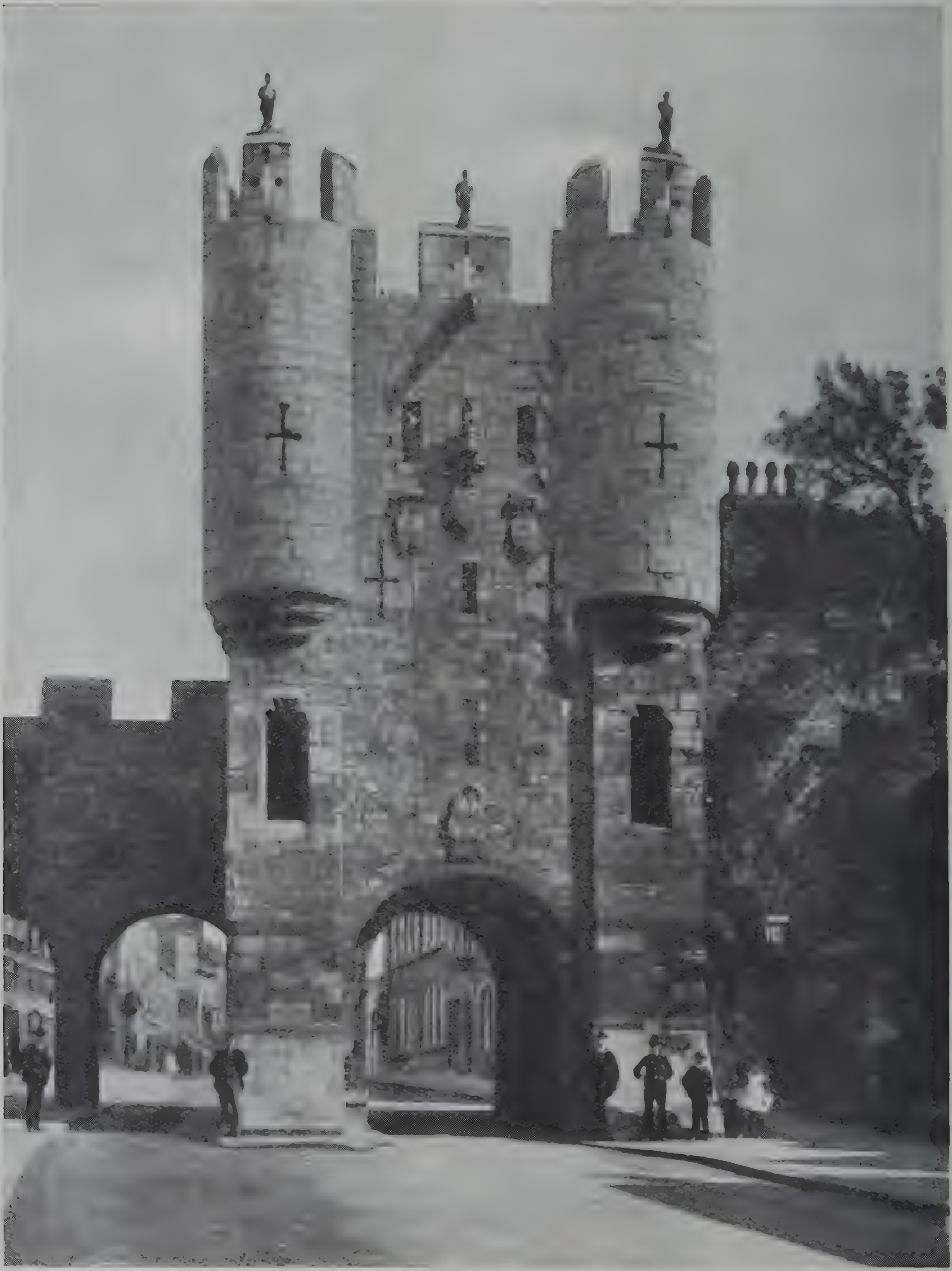
Heraldry, or the method of picture-writing to distinguish a man from his fellows, originated in such games as children play, where one pretends to be a bear or other animal, or later, the painting of these symbols upon the body, and on shields or targets, each symbol being the badge of the bearer.

At the time of the Norman Conquest, such devices did not follow any definite system, and there was nothing in the nature of descent from father to son such as arose later.

During the twelfth century a systematic treatment of the devices on shields gradually grew up, and in 1177 A.D., the three lions of the Arms of the King of England were developed, and by the beginning of the thirteenth century heraldry had become a recognised science. Rolls of arms, as the records were called, were kept of each armorial bearing, and descriptions accompanied them, more usually in French, but in the reign of Edward IV. heraldic language took in parts an English form, except in the case of purely technical words.

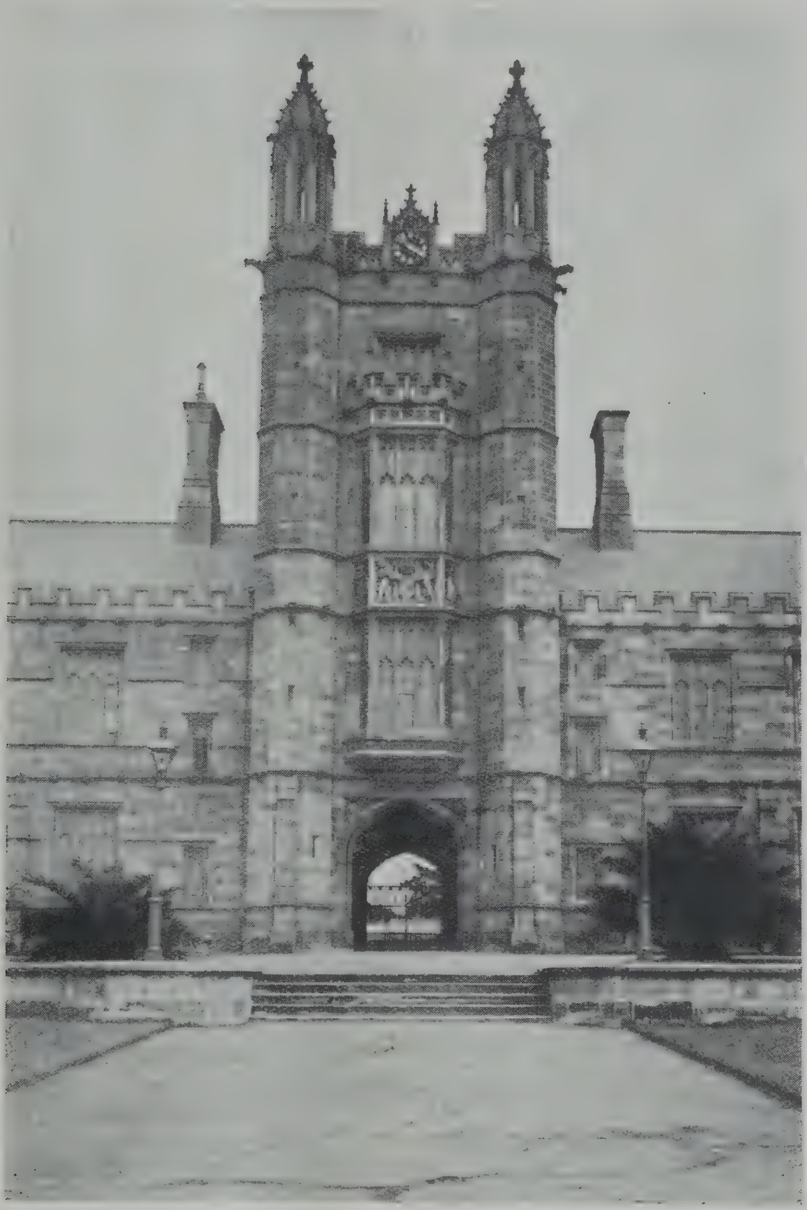
Heraldry appeared upon seals almost as soon as it became systematised, and about the same time it began to be displayed upon monuments, and in association with Architecture. One of the most beautiful early instances of shields bearing arms combined with Architecture can be seen in the aisles behind the choir in Westminster Abbey. This example is that of the masonry Shield of the arms of Old France, composed of the Fleur-de-Lys, placed about 1269, A.D.

Chimney pieces in England have at all times been used for the display of heraldry, which forms a fitting ornament to a room and Architects even in Australia, when the opportunity arises, can place such ornament to advantage. College or University Arms, the Arms of a State, Birthplace or those of an owner well executed in timber in such a position, have a charm that is pleasing to all.



MICKLEGATE BAR—YORK.

SHEWING THE HERALDIC TREATMENT OF THE WALLS.



THE TOWER, UNIVERSITY OF SYDNEY.

SHEWING ROYAL ARMS DISPLAYED BELOW THE UPPER ORIEL WINDOW.

ARMS OF EARL BEAUCHAMP.

ARMS OF SIR NORMAND MACLAURIN.

Heraldry, that symbolical and pictorial language of the thirteenth century, developed until the sixteenth century, when it was at its zenith and its application extensive, not being confined to monuments, chantries, etc., as the sculptured heraldry of the Middle Ages.

The Tudor and Renaissance periods, with their overmantles, gabled ends of houses and stained glass examples, have a lavish application applied, both in external and internal decoration.

In Henry VII. Chapel at Westminster Abbey, the exuberant treatment that heraldry in art reached in the first half of the Sixteenth Century is plainly visible—various arms of interest are to be seen in the stall plates there, and one, the tomb of Henry VII., also the bronze gates to the Chapel, show how suitably a metal may be used as a material of execution.

One often feels that the Architecture of the Tudor period might be termed the Heraldic period, for it then became an integral part of Architectural character.

The material used has an important bearing on the character of the heraldic scheme, either masonry, timber, glass or metal may be used for display; judgment of material lies with the designer for some arms give a more pleasing treatment in one material than another.

Architectural Terra-Cotta may yet prove to be a suitable material, and in this city, when heraldic ornament can be used, this material might be favourably considered.

The Tudor entrance porch of St. John's College, Cambridge, here illustrated, give a good example of rich heraldic ornament in masonry, the arms shown being those of the foundress of the College, Lady Margaret Beaufort, Countess of Richmond, consisting of sculptured antelopes supporting her arms on a background spangled with marguerites.

The University of Sydney has in its princincts some interesting heraldic ornaments portraying the arms of the Royal Family, College Arms, and the Arms of benefactors.

The main front contains the latter near the entrance to the Great Hall, and the Tower displays the Royal Arms in a very prominent position above the gateway. Faculties of the University display them over their entrance, as at the Engineering and Medical Schools and the Fisher Library contains some interesting masonry examples here illustrated. The description of arms, that mystifying jargon of terms describing the varied divisions of shields, etc., will not be entered into here, but it is interesting to record the conventional engraving in masonry and timber to denote colour. The representation of red (heraldic-gules) is made by vertical lines, blue (azure) by horizonal lines, gold (or) by dots; silver (argent) by a plain surface, black (sable) by crossed lines, green (vert) by lines inclined to the right. This system of the actual colour of the arms is adopted universally, and all our examples in Sydney may thus be identified.

ARMS OF SIR ARTHUR RENWICK.

ARMS OF SIR WILLIAM WINDEYER.

The Micklegale Bar, York, England, here illustrated, is a twelfth century structure, with turrets pierced with arrow slits, and forms an early example of a building with heraldry emblazoned on its walls.

The Churches of Sydney have few heraldic examples. The Cathedral of St. Andrew has the arms of the various early Bishops in tiles above memorial tablets, but generally speaking, our churches have little of this type of ornament. This type of ornament will in the main always be found in Europe, with its Churches containing the recumbent figures of knights upon altar-tombs in complete armour, with their arms emblazoned on their shields, but the Dominions can always have heraldic devices in their cities, around the Colleges, Universities, and Public Buildings, all being displayed in a much more interesting manner than at present. Westminster Abbey and Henry VII. Chapel will always contain the highest examples of Architectural heraldry in our Empire, and it is interesting to note the remarks of Brayley on this subject in his history of this splendid structure.—

> "There is no other edifice in the kingdom in which heraldic ornaments have been spread over its surface with such exuberant luxuriance. It would seem as though the Architect had intended to give to stone the character of embroidery."

The Offices of the Commonwealth Bank in this City have on their facade the arms of the States of the Commonwealth executed in trachyte, but they are lifeless forms that few realise are there, and do not add the dignity that they might.

The Mitchell Library, that vast and interesting storehouse of Australiana bears on its wall no such ornament whatever. Below the cornice there are bare ornamental shields that might to advantage bear the arms of the men who have been our early governors and other benefactors to the State; also does this apply to the Registrar-General's Office, which has on its front many shields awaiting the display of arms.

In the whole city there is not one example of the arms granted to Captain Cook's widow by Royal Warrant in 1786, and "to be borne by his descendants, and to be placed on any monument or otherwise to his memory"—the words of the grant have indeed in this State never been put into effect on any monument to this discoverer of our Continent. These arms displaying the globe, with his voyages on an azure shield, bearing two starfish, and having a crest of an upraised arm and the Union Flag of the eighteenth century, could to advantage be placed above his motto—"Nil Intentatem Reliquit," and recorded on some part of the Mitchell Library, or upon his statue in Hyde Park.

Heraldry is not altogether a dead form of ornament; there are many instances when it can be happily employed in this country, executed in all materials, and form an adjunct to the architecture of our National Public edifices.

Let us hope that Canberra structures will not lack this specimen of an interesting and ancient art.

INSTITUTE OF ARCHITECTS OF N.S.W.

MEETING HELD TUESDAY, 7th JULY 1925,

AT 7.30 P.M.

SIR CHARLES ROSENTHAL (President) occupied the chair.

The minutes of previous meeting were confirmed.

Apologies were received from Messrs. Norman Weekes, J. A. Kerr, W. Ritchie, and J. S. Adam.

The Chairman welcomed new members.
Mr. Stanley Amos Slatter, District Works, Dubbo, was unanimously elected by ballot as a new member.

THE CHAIRMAN stated that at the Council Meeting that afternoon the accounts in connection with the Exhibition just concluded had been dealt with, and members would, he felt sure, be gratified to know that the Exhibition had been more than self-supporting, and no demands had been made on the funds of the Institute.

The Exhibition had proved a great success, and the Hon. Secretary, who was responsible primarily for the work, had proved himself a financier. In addition to having been opened by Lady de Chair, the Governor himself thought the Exhibition of sufficient interest to visit, and he had with him as his guest the Governor of Victoria. The Federal Council of Architects was meeting in Sydney at the time, and all the members took the opportunity of visiting the Exhibition, with the result that they were all going back to their different States obsessed with the idea of establishing something on the same lines themselves. An invitation was extended to the Master Builders and kindred societies, and the President of the Federal Master Builders (Mr. Munro) and other representatives, including the Master Plasterers, together with some 2,000 members of the public, visited the Exhibition. It therefore went to show that the Exhibition was gradually improving, and he thought the result spoke well for those who exhibited as well as those who organised the Exhibition, that there should have been such a general response on the part of the public. A conversazione was held one evening, when many visitors attended, and had an opportunity of strolling round, and listening to the musical items. Everybody connected with the Exhibition was worthy of praise, and the Institute also was to be commended on its marked success.

In connection with St. Paul's Cathedral fund, he had to report that a sum of £30/9/- had been forwarded to the R.I.B.A., with the request that it be passed on to the Fund. That subscription was not made up in as general a way as was hoped, one subscription almost amounting to the total.

During the time he had been President of the Institute one visit had been paid to Canberra on a Saturday. Sir John Sulman, who was then Chairman of the Advisory Board, and Col. Owen, had then shown them round, and the Railway Commissioners had helped them in regard to travelling facilities. It was now proposed to make another visit in September. Mr. Butters, the chairman of the present Federal Commission, had expressed his desire to make such a visit as interesting as possible, and show the visitors all that is to be seen.

The question was whether they should allow their stay to extend over two days. The Railway Commissioners would help by providing sleeping car accommodation going and returning, and they would be entitled to special concessions in rates, going as a party. He thought they might arrange to leave Sydney on Friday night, have Saturday and Sunday in Canberra, and return on Monday morning. The Commissioners would allow the sleepers to be side-tracked. He thought the two days would be well worth while. A competition was just about to be launched for what would probably be next to Parliament House in importance, the War Memorial, costing a quarter of a million, and intending competitors might like the opportunity of spending a few hours there roaming round and looking at the site and conditions generally, literally getting the atmosphere of Canberra into their marrow bones.

(By a show of hands, members expressed their approval of the proposed two days' trip, leaving Sydney on Friday, 18th September).

THE CHAIRMAN said that arrangements would be made accordingly, and before the issue of the next monthly notice, members would be informed of the exact cost, and intending visitors would be asked to send in the hard cash required for the tickets and accommodation. Last time they had had about 20 visitors; he hoped this time they would have more. Canberra was now at its most interesting stage of development and he thought it was their duty to see it from a national point of view. If any members liked to bring their wives, arrangements could be made accordingly.

MR. SCOTT gave notice of motions for next meeting

> "That it shall be an instruction from this General Meeting to the Council to give serious consideration to the question as to whether the time has not arrived when this Institute should ask the Board of Architects to relieve them of the control of the purely business side of the profession, such as fixing the scale of charges, control of breaches of practice, and other such matters."
>
> "That it be an instruction from this General Meeting to the Council that they will at the earliest moment give consideration to the amendment of the scale of fees to correct the various anomalies contained therein."

THE CHAIRMAN extended a welcome to students of the University who were present.
He had been advised that Mr. Munnings and Mr. Adam had gone into partnership, and the Council had felt in receiving that information, that they would like to wish them well, and he was sure the Institute also would do the same.

ADDRESS BY J. E. MUNNINGS, ESQ., A.R.I.B.A.
"AGRA" AND "THE TAJ"

SIR CHARLES, and Ladies and Gentlemen, I hope you do not expect a formal paper to-night, because I confess I do not like writing papers. I much prefer to study my subject, and let it soak in, to use a vulgar term, and do my best with it in the ordinary way through speech.

When I was asked to give this address, I was rather at a loss as to what line to take, and what subject to adopt, and I might say that I want to thank Sir Charles for the inspiration I got, which enabled me to adopt for my subject to-night, "Agra" and "The Taj," preceded by some general remarks on India, more particularly in regard to my own personal impressions and work in that great country. The remark of Sir Charles to which I refer was to this effect: that one of the great wants of this country, in the higher positions, among our leaders and governors, was Men of Imagination and Vision. That gave me the idea of developing my theme—whether I shall succeed or not will rest with your judgment.

I have chosen Agra as one of the climaxes of the great works of India in the past, inasmuch as it represents the work and influence of some of India's greatest men, men of vision, one of whom was that rare variety and type that they call a "dreamer of action." Many of you will recognise in the views I will show places that I showed you nearly three years ago. I ask to be excused for showing them again, but as they have a direct bearing on my subject, you will realise their value. I feel, too, with regard to our great work as architects and architecture in general, that there is just a tendency on our part to treat our architecture purely from the external point of view, without realising to the full the great live forces behind any movement and work which give rise to their formal expression through the media of architectural forms.

The way I came to go to India was rather simple. I had spent over three years in England, and had returned to my own country, New Zealand (which I am glad to say is a part of Australasia, so I am not quite a foreigner in Sydney), and through a client of mine, I went home to England again, and was introduced to a gentleman who had lived in Burmah for 34 years. I used to stay with him at Bournemouth, and he said: "Have you ever thought of going to India?" I said, "Yes, it has been one of my ambitions to see the East. I would like to see the country, and I think also a knowledge of the East must eventually be of use to an Australasian."

The result was I applied for a post, and curiously enough the High Commissioner for New Zealand had laid the foundation stone of one of my buildings in New Zealand, and to my surprise I got the job. I went out and arrived in Bombay on the 31st December, 1909. I first went to stay with a sister and brother-in-law in Poonah, and spent a week with them. I had not then much opportunity of seeing any of the architectural wonders of India, but I did see in Barincutti, a little Hindu temple (of which I made one or two water colours), which struck me as the most perfect piece of stonework I had ever seen. I went from there to Calcutta, and met the architect to the Government of India. On his advice I decided to stay in Calcutta for a week or ten days, in order to be put wise to certain things about which he knew, which would be helpful to me.

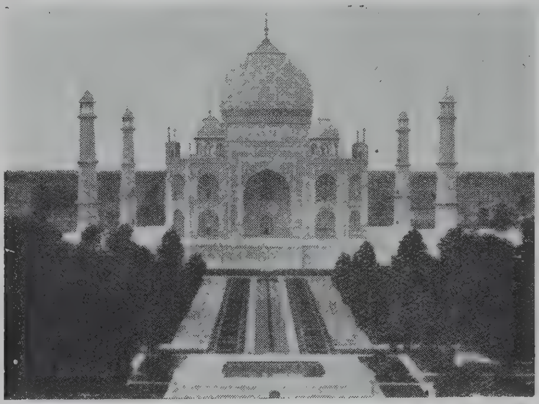
Eventually I arrived in Dacca, being the newly-formed capital of Eastern Bengal and Assam. Our Secretary has been out in those parts of India, and knows many of the places I have been to. Dacca was an ancient capital, and came into prominence under the late Lord Curzon. Eastern Bengal is very flat, and a very fertile district. The new capital had been commenced, and had gone considerably ahead. I had to complete Government House. None of the interior work had been done, and a great many alterations had to be made, chiefly at the instigation of the late Lord Kitchener.

There are roughly 34 million people in the province, and my work covered nearly every type of building, and I had a fairly extensive range of travel. The work varied considerably in treatment and materials. There is no stone in that part. Work was mainly in brick plaster, and bamboos and cocoanut fibre, and one had to adopt these materials to suit the various localities. Then came the partition of Bengal. That meant all our work in Eastern Bengal was swept by the board, and Eastern Bengal went to Bengal proper. Assam became a Chief Commissionership, and a new province was formed.

Being out of a job, that is where my opportunity came. I was sent to Ranchi, which was the temporary headquarters of the new province, about 2,000 feet above sea level. One of the first things I had to do was to erect a temporary Government House, which we constructed with a steel frame and jarrah quarterings, and I introduced reinforced mud brickwork. Bricks were made from mud just outside the site, moulded with a little longitudinal depression. Bamboos were split, and a layer of them put in between each course of brickwork.

That building was such a success that it is still going strong. I want to warn you to beware of any Government which talks of temporary buildings, because my experience is that those temporary buildings often become permanent. The Governor at that time was Sir Charles Bailey, a man of the old school of broad culture, and very sympathetic towards the Arts. One of the first things I had to do with regard to Patna was to go down there and study the conditions, climatic and otherwise, on the spot, just as Sir Charles Rosenthal suggests that it is advisable for us to go to Canberra.

It is sound advice, and I found it so in this particular case. The history of the place goes back to 300 years B.C. One of the ideas at least in forming this new capital at Patna was to pick up again the old historical chain of Indian tradition, and continue that traditional history by forming a new Patna on the remains of the old. The old Patna is a very monotonous, dull sort of city, with one main street about 11 miles long, with no buildings of any importance. India is not important from an architectural point of view. As a whole, it consists mainly of huts and small houses. The most ancient remains were just a few miles outside the new city. I went through the remains; there was an archaeologist excavating at the time. I had a piece of one of the columns which had been dug up, very much similar



1—THE TAJ MAHAL, AGRA.

2—AKBAR'S TOMB, SIKANDRA.

material to our trachyte, and the polish was still on that piece of stone. One of the interesting things about that palace was that it was found, when the excavations were made, that the palace had been built on a wooden raft, because around each column was found a ring of ashes, and it appeared that the palace had been burnt and the columns had gone down through the burnt raft.

I was told by Dr. Spooner that there were still some legends and traditions amongst the villagers in the neighbourhood that seemed to support different theories he had arrived at. Our own work in the new capital also took one back to the original race that came into India before the Aryans came in from the North-west, and drove the aborigines onto the plateau. Running through the site there was a certain depression, which was the bed of the old Sone River. I would like later on to give a lecture on the new capital. This serpentine form of the river ran through the site. On the east there was the East Indian railway, and deflecting the site for the new railway was a branch line running from the East Indian railway up to the Ganges, and the Ganges was crossed by a ferry or steamer up to the northern country. Those three lines formed the bases of the plan. It was not possible to build over that serpentine track, because it was all flooded. Some of the residents had been over the whole site in boats. The capital should never have been built there, but in India political influence often carries the day. I want to say that when one speaks of an Indian Governmental capital, one has in mind a very different city from one like Sydney or any similar industrial town. In India it is purely a functional Government centre. In Delhi they hope to regenerate trade by the construction of the new Capital, but I think it is doubtful if it will have that effect. India, as it has always been in the past, is still fond of pageantry and show, big performances and so on, and when Viceroys arrive it is necessary to show off these processions to advantage. At that time this particular Governor was very anxious that there should be what we call in more modern parlance, zoning. We tried to group the residences of the higher official class, the subordinate classes, and the Indian staffs of varying grades, and, of course, the way in which these different classes live alone gave sufficient reason for differentiating between the allotments placed at our disposal. We therefore tried to keep that grouping in view as far as possible. Unfortunately, during the time we were constructing the capital, other powers came in, and certain of our original plans were upset, only to be reverted to later on in the day. We tried to develop service routes. Our difficulty was with drainage. The country was perfectly flat. In 11 miles we only got a 13ft. fall, and there were religious objections to taking any of the sewerage into the Ganges. Ultimately, we provided for connection with drains, but we had to provide for the ordinary systems, and we developed service roads, with the idea of confining all drains and municipal services to these roads, and all light and water mains, which I am sorry to say was not adhered to. In India the compound, section or allotment on which a house is built, is generally fairly large, sometimes many acres, and in putting modern services into a town of that type, where you have so many yards of dead lines of pipe, live wires and pipes which were untapped, the problem was a serious one. One way of getting over the difficulty is by concentrating all services along intermediate surface roads. Our nearest metal for concrete was 85 miles south, and we could not afford to make concrete. We had not got the sand. Reinforced brickwork enabled us to overcome many of the difficulties. It seems rather remarkable as you can take your ordinary bricks and build them up into a girder of 40ft. span. We used them commonly up to 20ft. In the Secretariat building, where I had difficulty in obtaining steel, the advantage to be gained by the use of this brickwork decided me to take out the steel, and re-span with wider spans, and use reinforced brickwork. The advantage would not probably apply now so much when steel is cheaper. As usual with that type of construction, you always get some people who try to carry it a little too far. There was always a temptation to strike centres too soon.

I had great fights to prevent that. In India you always keep your work wet, so that it takes much longer to set than it does here or at home. I saw a celebrated smash, which was a remarkable thing, and which could only be explained by green work. When I spoke to Mr. Crouch about settlement of two inches, he said: "Oh, you need not worry about that; some of our buildings go down two feet."

Calcutta is particularly bad for foundations. I was asked if I would give one or two amusing little incidents if I could remember them. We had great difficulty in working there in colleges and schools, in catering and providing for the different castes and all their different ideas. At this particular time, in connection with planning for Patna University (which, by the way, took up a square mile of country), I had to design for an initial population of 5,000, and we had every type

3—JAHANGIRI MAHAL, AGRA.

4—MOTI-MUSSID, AGRA.

that you can imagine to cater for. I had a Mahommedan mosque and Mahommedan dining hall and school, and near by a Hindu dining hall. In the Mahommedan dining establishment we had to have a prayer room, and the difficulty was, these sites being quite close together, we were wondering what the attitude of the Mahommedans would be, or vice versa. I thought the best way to get over the difficulty was to refer the matter to the Hindus and Mahommedans on my own staff. I had some of the higher Hindus, an Arab Mahommedan, and several nondescripts, probably fire or snake worshippers. I said: "Think it over." They had already raised the objection that the places were too close. They thought over it for 3½ days, and they came back, and in all seriousness, the Hindus said that I should keep the Hindu dining hall as far away from the Mahommedan dining hall as a Mahommedan, sitting on his haunches, could throw a chicken bone. I said: "Go away and settle how far you can throw that chicken bone."

I want now to deal with one or two of the outstanding characters of Indian life. Asoka was a great town planner. I know the charm of trees along the roads in India. He was one of the first to introduce a State medical service. A great ruler was Babar, the first of the Great Moguls. He was probably one of the most interesting personalities this world has produced. He was a great general. He swam every river he came to in his campaigns. He was not only a great general and ruler, but he was a great writer and poet, a great musician, and a great painter; in other words, a general patron of the arts, and to those of us who are liable to become discouraged from the want of sympathy of those with whom we have to work, I might mention the words of Babar at the termination of one of his biggest campaigns, when he had been indulging again in music and poetry. He said: "For God's sake, do not think amiss of me for them." He had a very varied career. Henry VII. was King of England at this time. When his grandmother's husband was defeated, the conqueror gave her over to one of his officers. She was a wise woman and tactful. She made no fuss. She went to this man's harem without a murmur. Everything went alright till he came in, and then she gave instructions to her maids to stab him. She sent word along to the conqueror: "I have killed him; come and get me." I think it is part of the natural development which shows the advantage of co-operation between man and woman, that the three great personalities I propose to deal with to-night all owed a great deal of their success to their wives, and they were all successful in the fine arts, as well as great generals and rulers. There is this trait of a fine type of womanhood which runs down through the ancestry of these men, and which crops up at intervals. After Babar we have Humayun and Akbar, the latter probably the greatest ruler that India ever had.

He was a remarkable man of parts, a great athlete, a premier polo player of his day, particularly fond of animals, and nature study and plants of all descriptions. He was a great leader. He punished ruthlessly, but he quickly forgave. He was a great builder, and he was responsible for the Agra fort.

It is quite impossible to judge Indian work from the western standpoint, and our modern standpoint in particular. If one is to obtain any value from the study of these ancient buildings, one has to consider them primarily historically, with regard to the functions they had to perform at the particular time they were built, and you must study their history in the light of its own modernity, not of ours. If we begin to study these buildings from our standpoint, we will get hopelessly at sea. One has to live in a country for a great many years to understand them. It is well not to be too severe in judging these works from our modern standpoint. If ever a man lived to whom architects ought to bow the knee, it was the late Lord Curzon.

What that man did in India for architecture, it is difficult to overrate. Now the finest leaders in history have been interested in the arts. In fact, it seems to me, from my puny study of the problem, that of all races which have ever lived, none have ever reached any height in civilisation which have neglected the arts, particularly architecture.

The Taj Mahal, Agra took 17 years to build, and 20,000 men were employed on it. It is the greatest monument to woman that has ever been erected. It is a monument to marriage, and above all a monument to motherhood. There could not be a better criticism made than to criticise its femininity. It was intended to portray the wonderful and beautiful femininity of the wife of Taj Mahal. It is feminine from beginning to end. You could not take it for anything else. Its beauty to my mind is in its simplicity.

In this building in particular and in many others the ornamentation is confined more to a decoration of surface subordinate to the architectural form. It does not conflict with the architectural form in three dimensions.

It arrives at a modulation of the surface that can be read closely, but not at all at a distance. Often one sees ornamentation of buildings which cannot be seen well at a distance. It is the fundamental form of architectural work that gives it its greatest claim for study and life and eternal quality, not all the little accidentals. We were subjected to great criticism in our work, and we used to get it pretty hot at times. I like criticism, provided it is reasonable, and if it is argued out on the basis of fact and truth. I was surprised in my travels that I could not see any difference between a lot of the mouldings that had been used by these Indians and lots of the Greek mouldings. It struck me as an interesting fact that possibly different races working towards the light of architectural forms have in many cases quite independently of one another arrived at the same forms of mouldings. Some of the waterworks in India are particularly interesting, especially at Bijapin.

Mogul Portrait of Emperor Shah Jehan, a reproduction from an actual old Mogul painting of the 17th century.

Marble screen enclosing the tombs of Mumtaz Mahall and Shah Jahan.

In the middle of the day in the glaring heat, all buildings are inclined to look hard, but looked at in the sunrise or the moonlight, the thing is a dream.

I would appreciate it if members would make any criticism on what I have said. When I say these buildings are not to be judged from the western standpoint, I do not mean to say that you should not have your ideas about them, but do not criticise them from our modern standards. Our duty as architects is to get at the inside and work out. I thank you for your attention.

THE CHAIRMAN expressed his personal appreciation of Mr. Munning's lecture. He thought that if students, when they went abroad, could possibly include in their trip a visit to India, it would be well worth while.

Mr. B. J. Waterhouse moved a vote of thanks, supported by Mr. A. S. Hook, Mr. W. A. Nelson, Professor L. Wilkinson, and Mrs. Taylor.

MR. MUNNINGS returned thanks for the kind wishes expressed.

THE CHAIRMAN further stated that Mr. Munnings had not been very long in this State. He had come from New Zealand, and prior to that he had had ample opportunity of seeing a good deal of India, and of having a finger in the pie in the architectural development of that country. They were very glad that Mr. Munnings was taking not only ordinary professional interest in his work, but also a close interest in Council matters. A prominent member of the Architectural Board had yesterday made special mention of a certain piece of Mr. Munning's work in the North Shore district—the Knox School. He welcomed Mr. Munnings, and asked him to deliver his lecture.

THE ANNUAL DINNER OF THE INSTITUTE OF ARCHITECTS OF N. S. W.

18th JUNE, 1925

SIR CHARLES ROSENTHAL (President) presided.

LORD FORSTER (Governor-General) was the principal guest.

SIR CHARLES ROSENTHAL proposed the toast of "The King."

SIR CHARLES ROSENTHAL: Gentlemen, we are delighted to have His Excellency the Governor-General with us this evening. Our members will recall our annual dinner two years ago, when Lord Forster was our principal guest. It does not seem like two years ago. Our younger members will remember some good advice he gave us. He told us something of his early married life and difficulties, and I think the advice he gave the young architects was to marry young—they would find in their wives very useful helpmates. I want to say how delighted we are to have him with us, and it is with a good deal of regret that we realise that the time is drawing near for him to leave Australia. I remember on the last occasion I referred to the fact that most of our Governor-Generals, when they returned to the old country, were really true friends to Australia, because of the knowledge they had gained in this part of the world, and the very material help they gave in advising those in England of the big problems which face us here, and which have reference to the Commonwealth, and I rather made a bungle, I think, when I referred to the possibility of the Governor-General going back. He took me to task, and suggested that he was not yet going back. However, we have seen the statements in the press, which compel us to believe at last that he is going home again, and I am sure the majority of us feel that could it have been possible, we would have been delighted to have seen his term in Australia extended. It has been most gratifying to our people throughout Australia and those associated with architecture, to see the close personal interest, Your Excellency, that you and Lady Forster have taken in all those matters which affect the welfare of our people in Australia. There is hardly a portion of this Commonwealth you have not visited, including the Mandated Territory, and very few of our own Australian people have got that far. In this way you have added to your own wonderful fund of knowledge of Empire matters, and our people have appreciated to the full the opportunity of meeting the representative of His Majesty the King. Everywhere one goes throughout the Commonwealth, one hears references to the visits of yourself and Lady Forster, and I am sure I am only voicing the feelings of us all when I say that while we are delighted to have you with us to-night, we regret exceedingly that it appears to be the last time you will be here as Governor-General. I hope it will not be the last time, because I hope the charm of our Australia will induce you to come back for a visit at some later period. We hope it will be so. If you would only give us timely warning, we can assure you of a place at our annual dinner when it is held again. The opportunity does not come to us professional men very often to have the representatives of His Majesty so closely in touch with us. You will remember at the last annual dinner, the State Governor, who had just arrived in Sydney, was our chief guest. We feel your presence here is a compliment to the profession generally, and your acceptance of our invitation is surely an indication to us that you have more than a passing interest in the development architecturally of Australia. Observation generally must have shown you that after all you may go to other parts of the Empire, and find worse architectural examples than in Australia. Were it not for the fact that we have representatives from the other States who are joining us in conference, I would even go so far as to suggest that the architects of Sydney might bear favourable comparison with other parts of the Commonwealth, but as Mr. Henderson has got to speak after me, I had better not do so. Gentlemen, I ask you to drink to the health of His Excellency.

THE GOVERNOR-GENERAL: Mr. President and Gentlemen, I thank you very warmly for the way in which you have received the toast of my health, and for the nice things that Sir Charles has said about me. It is very trying to me to come to public functions now that the fact that I am going home has been made public, because people say such extremely nice things about Lady Forster and myself, that it makes it very difficult for either of us to reply. I can only take it that the kind things that are said, and so warmly echoed by the audience to whom they are addressed, intend one to carry away with one the feelings that the friendship in Australia for us is very warm, and very true. That is the impression that both Lady Forster and I will carry home with us. Ever since we came here nearly five years ago, we have met with nothing but kindness and consideration, nothing but demonstrations of goodwill wherever we have been, and it has been our good fortune to travel widely throughout Australia. So we shall take away with us the memory of a singularly happy five years spent in this sunny land of Australia. It gives me real pleasure to be able to accept your invitation to be present this evening for a very simple reason, not only because I am glad to meet Australians wherever I go, but because Lady Forster and I both realise and recognise the debt that the country owes to its architects. People do not realise it; they do not talk about it; they do not dilate upon it. But if you travel as we do, and if you hear the comments made upon Australian buildings, both public and private buildings, that we hear from people who come to visit or stay with us, lunch or dine with us, who come from overseas, I think you would be very much gratified. We have travelled about a good deal, not only in the capital cities, but in every part of Australia, and while no doubt there is room for great improvement, room for a very large increase in the number of fine buildings (and I am sure that is a sentiment which will be very warmly echoed by the company present to-night), still I think you are entitled to congratulate yourselves upon the fact that there are in every capital city and many other places, some very fine examples of architecture, such as anyone may well be proud of. There is another aspect that strikes a visitor from overseas. I have travelled through the suburbs and residential areas, and one thing that constantly impressed both Lady Forster and myself was the artistic, original, and altogether pleasing design of such a large number of the homes that we saw. I am not speaking about the internal accommodation, because I have no personal knowledge of that—I can only speak of the exterior, but having some considerable experience of suburban property in London and the old country, the difference between suburban homes there and here is very striking indeed, and I am sure, gentlemen, it would give you very great pleasure if you were to hear many of the comments which I have heard from overseas visitors in that regard. I wish to thank you once again with very real and very sincere gratitude for the cordial reception you have always extended to us, and for the kind things you have said about us to-night.

MR. B. J. WATERHOUSE proposed the toast of "The State Parliament." Your Excellency, Mr. President and Gentlemen, it is my privilege to-night to propose the health of the State Parliament. When this little bombshell was deposited on my door step, I began to try and review matters in order to ascertain something about the State Parliament, how it affected architects, what it had done for architects, and probably what it might do for them, and I have discovered that what it had done presented a rather formidable list. I ticked that off, and then I began to think what else we would like them to consider (and before going further, I would like to say with what pleasure it is that we have Mr. Mutch with us, and how greatly also we regret that Mr. Bruntnell is not able to be present also). I discovered that if I tabulated all the things that we would like to bring under the notice of the State Parliament, it would be something on the lines of those mighty tomes, two I think, prepared by Andrew Lang, entitled "Scotland's Work and Worth," which, when presented to an admirable Scot, evoked the remark: "A very brief preface to a noble, worthy, and inspiring subject." So I think it better to indicate at the outset that what we do require from the State Parliament would fill volumes equally large. More pertinent to the moment is to think seriously of how much we do owe to the State Parliament of N.S.W. I think architects have been animated for many long years in directions which will benefit, not only architects, but the citizens generally, and I do think, and I am sure you will agree with me, that for some things they have done, the State Parliament deserves every credit, and we wish to acknowledge our debt to them. There is the Chair of Architecture at the University. I consider it has conferred upon the profession an inestimable boon, the result of which it is impossible at the present time to forecast. We know as architects that it will be ultimately reflected in our work, in the calibre of the men in the profession, and in the appreciation by the public of the work we all have so much at heart. Secondly, you will remember that another matter dear to our hearts was Registration. That has been accomplished largely through the efforts of the State Parliament. All our planks are non-contentious, and I think that is why we have received the support of varying Governments quite irrespective of party. Our effort has been to get something without any ulterior motive for the benefit of the profession and the public, and we have always received consideration from them on those points, and succeeded in achieving those two things I have mentioned. Why do we want those things? We are naturally interested in our own careers, naturally interested in producing and carrying out work, but I think behind that there is something else, and one gathers that thought from chats with one's brother professionals.

The Chair of Architecture has raised the standard of the profession, registration has further enhanced its value, and the re-action of that will be reflected through the students who pass through the Chair of Architecture and travel abroad, and come back again. Why do we want it? We want it so that those architects who have benefited by those travelling scholarships, who have received the protection of registration, will realise that they are working for a better city, a city which is better to live in, more conveniently laid out, with its streets and buildings, beautiful and more efficient. So that such work will react again on the citizens, and make them better citizens, more intelligent and enterprising, and their lives better and brighter. In a few years we shall have two million people in Australia, and you will realise that it is inevitable that architecture is, and must continue to be, an important factor in the city, therefore we are very glad that these things have been accomplished. They have not been accomplished without the assistance of the State Parliament. We think their good work can still be carried a great deal further. We feel that there is a slight anomaly in the situation as it stands to-day. The State has carefully considered and granted us a Chair of Architecture, which imposes a very rigorous course for our students who travel abroad, and when they return, although they can take part in the erection of the commercial buildings of this city, they would like (and I think every architect is animated by the same desire) to do something for our State, and that can only be achieved by submitting our important buildings to open competition. I think every architect has the right to expect that he should, by reason of his skill and educational ability, have an opportunity of submitting designs for such important buildings as the Law Courts or buildings in connection with the extension of the railway system, particularly at Circular Quay. We do hope this will be considered, and we feel that great good would be conferred on the profession, and on the citizens as a whole in that direction, if something in the nature of a Civic Advisory Board was appointed, a body composed of architects and professional men who are willing to give their time for nothing to the State, a body which would have some say in various matters of importance, besides the larger scheme of city development, at present being considered by the Sydney Regional Plan Convention, to say where public monuments are to be placed, where squares are to be prepared on good sound lines. Behind it all is the great desire on the part of the architects to do something for their city—that is all they ask. They realise that the material wealth or commercial success a city may receive is not the ultimate object of any intelligent and highly-cultured people. Commercial success only paves the way. Things which are more enduring are those which go deeper, and we can provide those by beautification of the city, so that the lives of our citizens will be brighter and better, helping to develop that civic pride which is essential, and surely in this young country that is what we so sadly lack. May I close these few remarks by quoting:

"All passes on; art alone enduring stays with us; the bust outlasts the throne; the coin Tiberius."

MR. MUTCH, Minister for Education: I express my thanks to the proposer of this toast, Mr. Waterhouse, for the excellent manner in which he has spoken, and I would express my regret that I am the only member of the State Parliament present to hear it. I feel myself a little diffident to-night, because I am just again in a sense the Minister responsible to the architects for their legislative welfare. Others might have done what I did previously, but it was just because I was the victim of time and circumstance that enabled it to be done while I was Minister. I am quite well aware, and certainly from what Mr. Waterhouse has already said, I am perfectly sure that I will shortly be called upon to do something more than has already been done, but I may say that what is to be done will be done willingly, readily, and with a knowledge of the fact that what is done in this direction will meet the sentiments in a sense expressed by Mr. Waterhouse in his address to-night, that we must in our time do something to make this city and this State what it should be, and what we can make it. I entirely agree with Mr. Waterhouse when he suggests that commercial success is not the only thing to any man of feeling or sentiment, and I certainly hope that I may be counted as one who will join with him in the work that yet has to be done by those who have come to positions in life, or who have been given talents by the Almighty, by which they can benefit the rest of our citizens. I hope I may have your help in doing the work that public men are called upon to do, to express in a legislative sense the ideals that high-minded men possess. I personally hope to have the continued co-operation of those whose work brings them right to the very pinnacle of the highest, with that expression of thought, feeling and sentiment that can be possessed by men in any profession. I am not here, nor am I in a position at this moment to make any definite promises.

I am a subordinate Minister, and I leave matters of policy to my leader, which is the proper thing for any man in my position to do, but as the ministerial head of the department which has as its concern the affairs of architects and architecture in many shapes and forms, I sincerely hope that I will be able to advise my leader of the spirit and sentiment expressed by you gentlemen from time to time, and the wishes that you set down directly in writing and in speech, which have as their aim the disinterested progress, not only of the city, but of the State, and if I can take your wishes so expressed unto myself and have my say, and whatever influence I have with the Leader of the Government, and have legislative effect given to them, I too will have joined you in doing something for the country to which we all belong. I am well aware, gentlemen, that many an architect in Sydney outside of his own professional needs and requirements in a commercial sense, readily gives his advice and counsel whenever called upon to help and benefit the various needs of our State. No man who occupies any public position can do other than readily acknowledge how freely professional men, and especially architects, have been ready to join Boards of Commission and Advice, and have been so willing to give to the State authorities the assistance they need in connection with great problems that arise from time to time in the development of the cities and towns of the State.

I hope the fine spirit that has been shown will be more availed of in the future than it has been in the past, because we do want all that assistance, and we want all you can give us in that direction, not necessarily for nothing either, and when I say that I mean that your reward should lie in the fact that you do this or that not for what you get out of it, but because you were able in your time to contribute something to the welfare, progress and beauty of the State. I would like at this moment, as one who was in the happy position of having secured the passage of the measure which obtained for you registration, to express my deep gratitude to the whole profession for the magnificent unselfishness that actuated them in providing travelling scholarships for young Australians to go abroad and come back to this country with a broader and better education than they could have got if it had not been for your assistance, and I sincerely hope that work will not be discontinued but will be extended, and if there is any direction in which as Minister I may be able to assist, I hope you will readily and quickly call upon me. I thank the profession for the splendid way in which they met a situation quite voluntarily, and may I thank the Board of Architects, and particularly its President, who is here now, for the ready assistance they gave to my immediate predecessor, because if there is one department of the State in which there can be but little difference of opinion, it is in the Department of Education, so long as men are of the right mind. I sincerely regret to-night the absence of Mr. Bruntnell, due no doubt to circumstances over which he has little control. He and I have worked together in many matters. While differing radically, of course, on special matters of policy, on most questions connected with the Department of Education, we have worked with the utmost cordiality during the whole of the past five years. I would have liked to have been able to express in his presence my thanks to him for the assistance he gave to me during the past three years when he was in office, which I hope I shall be able to reciprocate during the next three years when he will be in Opposition. I must thank you for the kindnesses extended to me by the profession. I make no promises to-night, but I have listened with both ears wide open. I agree with the sentiments expressed by the proposer of the toast. I hope I may be regarded as one who is inspired by exactly the same ideals, and I sincerely hope I may be able to carry those ideals into effect in my Ministerial activities.

MR. G. SYDNEY JONES proposed the toast of "Schools of Architecture."

Your Excellency and Gentlemen,—I do not know why I have been asked to propose this toast. I have been cogitating, and I believe it is a put-up job. I think architecture has much to do with life. No man is worthy of the name of architect unless he has a high standard of education. For the boy who cannot afford to go to the University, we expect the standard to be that of the Leaving Certificate, no less than that, and those who go to the University must pass the Science Matriculation before they are admitted to the Schools of Architecture there. Probably only a few here remember just what were the Schools of Architecture a number of years ago.

It is only five years since the Chair of Architecture was established. Previous to that we had a very primitive school as a Technical College before Mr. Nangle was appointed Director. When he was appointed, he was wise enough, or rather his views were broad enough to develop the school in such a way as to establish a diploma course in architecture, which course, I am sure, I could not pass at the present time. Then as to the University, we are more than obliged to the Government for the work they have done. It was to Mr. Holman's administration that we are indebted for the Chair of Architecture, and I would like to remind you that the particular man who was chiefly responsible in inducing Mr. Holman to grant a sum of £2,000 per annum for the establishment of that chair was the late Mr. Arthur Pritchard. It was due to his influence and advice.

There are only two schools in this State at present which we consider Schools of Architecture, in order of their seniority, the Technical College and the School of Architecture at the University. This is an age of organisation, and speedy advance in applied sciences. I feel if we can induce our young men to get the ideal and spirit of Empire into their designs, we will get something that in the future will speak to the world. Architecture is a factor in national life. Service is the keynote of the work of all architects—I stress that point. These ideals ought to be expressed in our buildings, more particularly our public buildings. How it is to be done, this is neither the time nor the place to say. I want to point out that if our students can be imbued with these ideals they ought to be able to do something for us in the future. This is the part I want to be very careful about. As a body of architects this Institute is in close touch with the schools, and we feel that we have the confidence of the public. The directors of those schools are, in order of their seniority, Mr. James Nangle, Director of Technical Education in this State, and my friend Professor Wilkinson, Dean of the Faculty of Architecture at the University of Sydney. Now we believe that these men are going to turn out students who will do their best for Australia, and I will ask you to couple the names of Mr. Nangle and Professor Wilkinson in this toast.

MR. JAMES NANGLE: First of all, I would like to say how much I appreciate the kindness of the President in allowing this toast to come a little earlier on the programme to enable me to regretfully leave this pleasant gathering. In regard to the toast which you have so enthusiastically received, may I say that I thank you very much indeed, not because of the evident sincerity with which the toast was received, and the cordiality surrounding it, but rather because I know from long experience how much and how sincerely you support the work that has been going on for many years in this State in the way of educating those men who are to be the future architects of N.S.W. and the Commonwealth

I, as many of you know, have been connected with the architectural work of the College for many years, and although as the mover of the toast said, it has only been within comparatively recent times that we have been able to bring that course up to the standard we have, I know that during all those years, I have always had the inspiration that comes from an earnest backing of all the members of the architectural profession, and especially of this Institute. The question of architectural education received an immense impetus when through the efforts of the late Mr. Pritchard and Mr. Peter Board, the late Director of Education, and the Government of the day, a Chair of Architecture was established at our University. It seemed to many of us who had worked for something of that kind that that work of training architects was at last put on a proper basis, and that it brought about a recognition of the great profession to which we belong, and the importance of that profession to the State. I think it has had a benefit of that kind in many directions, but most certainly its direct effect has been to improve the quality of education generally. The Department with which I am connected had to directly ctrengthen its course as a result of the high standard which would follow upon the establishment of a Chair of Architecture at the University. We have done our best to do that, and I believe that the course at the College is now in such a state of excellence as to produce men we will be very proud of as practitioners in this State in the future. May I say that I think there is no work that the architectural profession can more usefully attend to than that of the education of its on-coming members. After all, it is a question of education in the brightest sense of the word. Through our splendid system of State education, it is quite easy nowadays to get those leaving school to enter either the University, or into an architect's office as pupils, and in either case to get them to follow a good course of special education in architecture, backed up with an extension of their general education.

That is going on at this day, and I believe that the work is being well done. As a matter of fact, it has been said here to-night, and in that connection, I am reminded of a story which is not altogether inapropos. A very distinguished officer was discussing the merits of some soldiers, their general qualities, and so on, and when he came to the question of their fighting capacity, he said:

"Yes, I believe they are amongst the best fighting men in the world—they would admit it themselves." I believe I would admit myself that we are doing good work. Nothing gives me greater pleasure than to acknowledge the splendid value of the support we have received from this Institute. It would have been impossible to have carried on without it in the face of the adverse circumstances. It is very difficult to finance, but even that is not the most difficult aspect. It would be absolutely impossible to carry on unless we were inspired and helped by the kind and generous support which has been evinced here this evening to those who have to attend immediately to the education of our young architects. The work of architectural education is more difficult in this country than in a country nearer to the centres of learning. Here we are at a great distance from the centres of old architecture. We are in a new country, still vast in its spaces, and we have not the advantages that those who wish to become architects have in the older countries, and it is a matter of extreme importance that we should pay special attention to the education of our future practitioners. As the effect of bringing in registration of architects, two splendid scholarships are now available. Every young man who goes through the University or the Technical College has an opportunity of a trip abroad to the different parts of Europe.

PROFESSOR WILKINSON: Your Excellency, it is a great pleasure in responding to this toast of the schools to have the opportunity of thanking you personally, and as a body, for the many kindnesses you have shown towards me personally, and to the assistance you have given me in my official work here. I have been here nearly seven years. I arrived in Australia not knowing a soul, but now I cannot count the number of my friends, and I have only just enough enemies to make a little spice in life. I would like to thank this Institute for what it has done in securing the foundation of the School at the University, and since its foundation for the way it has supported that school. The Institute will be called upon for further assistance, owing to the lengthening of the course from four years to five. It will be called upon to conduct one of the most important final examinations, that is at the request of the British Architects in London, who have recently agreed to recognise the School in Sydney as a recognised School of the Royal Institute of British Architects. That, I think, is an excellent thing. It means a standard throughout the Empire will be set and worked to, and I hope that arrangements will be developed in such a way that in a few years the Royal Institute of British Architects will be not merely a Royal Institute of Architects in Great Britain. That may quite likely come, and His Excellency when he goes back may be able to help that movement there. I should also like to thank the many men here to-night who have been of such assistance in the work of establishing the School. I refer to Mr. Hennessy, who assisted me for a considerable time, also Mr. John Moore, Mr. Hook, Mr. Harris, also the Government through Mr. Mutch, for all they have done to assist and encourage architectural education, and the Board of Architects and Mr. Godsell, its president, for the way in which they have put the matter of education in the forefront of the business of the Board. I am certain that will have a beneficial result to the public. I thank Mr. Sydney Jones for the speech in which he proposed this toast, and I express the hope that not the duds, but the brightest amongst the community, may be not only architects, but "heralds of a brighter day."

MR. ANDERSON proposed the toast of "The Federal Council."

Your Excellency, Mr. President and Gentlemen, the last two toasts have been somewhat parochial in their character, the State Parliament and our Architectural Schools and in the latter we do not get even beyond our beautiful city, of which we are so proud. I want you to close your eyes and imagine you are taking a great wide sweep because the toast I am proposing embraces the whole continent, and not the continent only, but a beauty spot down to the South, Tasmania, the gem of the whole Commonwealth. I happen to be a native thereof. This Federal Council is just as important in the architectural world as the Federal Parliament is in the political world, because we are looking to this Federal Council to give us a lead and a guide. We are looking to them to promote architectural legislation within the spheres of our institutes to reach from Cape York to Storm Bay, and from Perth to Sydney. The foundation of that Council came about this way. In January, 1901, we became a Commonwealth, and we took the first baby steps in nationhood, and the architects, never behind the times, thought that the time was ripe that we should have a Federation or a Federal Institute, one sweeping institute to cover the whole of Australia, something like the politics of the day. We missed the bus, and instead of getting unification politically, we became a federated State, a commonwealth of the architects was too far ahead. They wanted a unification, but it was impossible to bring it about in those days. Somehow or another those old inter-State jealousies, that friction between Victoria and N.S.W., as to which the greater, as if there was ever any doubt about it. Being a Tasmanian, I just leave the question —as if there was ever any doubt about it. I do not say which side of the Murray gets pre-eminence in that respect. Those jealousies and frictions were not confined to the outside world. Somehow or other a little sand had got into the bearings of the architectural machinery, and although strenuous efforts were made in those days to bring about a Federal Institute, matters failed. Attempts were made again and again without any success until the Commonwealth Government (and one does like to know that even in the past Governments have shown some signs of enlightenment) did recognise that there was such a body as the architects. They were perplexed about a building in Canberra, and they had determined upon a world-wide competition for it, and they wanted a chairman of the Board of Adjudicators, and they wisely decided he should be an Australian. They called together the presidents of all the Institutes of Architects of Australia to meet in Melbourne, and we met.

I think in this room to-night there are four who met in Swanson Street, Melbourne, in 1914, to select the Chairman of the Board of Adjudicators for Canberra Parliament House, Mr. Cote, Mr. Chambers, Mr. Rutt, and myself. Victoria, if renowned for nothing else, is renowned for its hospitality, and the Victorian Institute got us into those rooms one night, treated us nicely, and then calmly suggested: "Don't you think it is time the different institutes became a little bit more closely associated with one another?" and they looked at me. I happened to be the President of the parent Institute, and what could I do but promise there and then that as soon as possible we would see if some steps could not be taken to bring the institutes closer together. In compliance with that promise, in November, 1914, a conference was held here in Sydney, at which all the institutes were represented, and again in this room to-night there are only three of the members of that conference, Mr. Chambers, Mr. Sydney Jones, and myself. We drafted a constitution, and we scattered it broadcast. We asked for amendments, and only two amendments came in; only two recommendations were made, and I had the pleasure in April of declaring in Melbourne that the Federal Council of the Australian Institutes of Architects was hereby duly formed. That was the beginning of it. We were young, we were not strong, and had not much experience, so we wrote to the Minister for Home Affairs, and told him that if he wanted any architectural advice, we would be only too glad to give it to him. We got a most cordial reception from Mr. Archibald. He promised to consult us in all things architectural in which the Government had any interest, particularly in regard to Parliament House, and while that gentleman held office we were consulted, and you will find in the minutes of the meetings quite lengthy correspondence, which took place in connection with the Federal Parliament House. Then there came one of those slips, and we were just quietly shoved on one side, and the war came and seemed to paralyse all those nobler and beautiful arts in which we had been used to engage. However, time went on. The Federal Council has now succeeded in bringing about one set of architectural conditions from Perth to Sydney, and from Darwin to Hobart. We wish them every success. The aim at the back of the minds of those who met in Melbourne in 1914 was not a Federal Council; it was one great Institute which should embrace the whole of Australia, whose members would be able to take their place with any architects in the wide world, and who would become a branch, and no mean branch of the parent body whom we all respect, the Royal Institute of British Architects. If we are going to make our profession rise as it should, we must be united. This Federal Council has met in the past, and meets to-day with that one aim and object in view, that right throughout this land which Your Excellency has referred to as the Sunny Land, there shall be just one law, one rule, one Government, in our architectural world.

MR. HENDERSON: Your Excellency, Sir Charles Rosenthal and Gentlemen, I thank His Excellency first of all for the sympathetic and encouraging remarks he passed in regard to the work of the architectural profession in Australia. I thank your President and Council for their kindness in making it possible to synchronise your annual house dinner, with the meeting of our Council in Sydney, and I also thank the proposer of this toast for his extremely interesting history of the early activities of the Council, and the kindly way in which he has spoken.

I would like briefly to refer to the functions of the Federal Council, because, as the proposer of this toast said, it has worked hard for some years with two main objects in view. The first of those has been uniformity of practice in certain respects throughout the various States of the Commonwealth, with the idea of gradually drawing the State interests together into one Australian Institute of Architects. The principal matters which the Federal Council has concerned itself with during the past few years have been: First, the standard or code of ethics for the profession; second, standard articles of association for the whole of the State Institutes; third, the standard of our fees; fourth, standard conditions of competition in relation to architectural competitions; and fifth, the question of standard conditions of contract to operate throughout the Australian States, a matter we are now tackling with earnestness. In regard to the first four, the whole of the States are in uniformity with the exception of one small item in relation to one State, and one small item in relation to another. If within the next month, by patient and diplomatic work we can bring the whole of the States into line, we will have overcome the main stumbling block for the formation of a Royal Australian Institute of Architects. The other function is to bring about through our Council that the architects of Australia will speak with one voice in regard to Federal matters, and in particular to negotiate with the Government in regard to the construction of our national capital at Canberra. We must realise that Canberra is not a matter of a year or two, but of generations. The Federal Capital will continue to be built, added to, and developed as long as this country grows in importance and population, and we must also realise that our Federal Council is at present but a loose link binding the various States together architecturally, and we can never speak as architects with a full emphasis while we are still only loosely bound together.

At our meeting to-day, we reversed the order of business slightly, and I have to inform you that we elected Sir Charles Rosenthal as President for the ensuing 12 months. It has been the practice in the past that our Federal President shall have a second year in office, for the reason, as you all know, that our States are widely separated, and matters requiring prolonged negotiation come along, and if the chain were broken for a year, the link would be even looser than it is at present. I trust Sir Charles will keep on for two years for the following reasons. After the Federal Parliament has met at Canberra (and I believe that will be inside the next 24 months), I want Sir Charles Rosenthal, with the support of the whole of the architects of Australia, to call a convention of architects at Canberra from the whole of the States, and for those men to settle down at Canberra, and discuss seriously the formation of a Royal Australian Institute of Architects. I am sure if Sir Charles, as the President of the Council, and of the senior State Institute, called that convention, the response would be almost unanimous from the whole of the States. The only broad question which I think will then have to be discussed at such a conference would be that of the education of architects and the standard of admission to an Australian Institute, because all the minor matters such as ethics, competitions, conditions of contract, fees, and standard articles of association will have been disposed of by the Federal Council within the next 12 months. Another matter which I hope architects will take up is the question of approaching our Federal Government, and asking them to make at Canberra a grant of land for a convention hall. If we were successful in obtaining that grant, I hope that would be followed by an architectural competition throughout Australia for a permanent convention hall at Canberra, the nucleus of which could be built straight away for occupation, not only by architects, but by scientific and professional and technical federated bodies. I think the creation of such a meeting centre at our Federal Capital would do an enormous amount to foster Federal and national spirit throughout Australia, and would be of inestimable advantage, in that an enormous number of our Australian people who care little about the development of Canberra would see what had been done in the City, and the delightful surroundings in which they could meet and confer far from the many distractions of our State capitals.

MR. DAY proposed "Board of Architects."

Your Excellency, Mr. President and Gentlemen, it is my privilege to propose the toast of the Board of Architects of New South Wales. When it comes to a real commonsense way of handling the higher powers, there is a good deal to be said for the methods of our friend, John Chinaman. He sets up a Joss of his own making, and renders him respectful service, and obedience—so long as things go well. When they don't he shows his displeasure with things in general by banging his Joss with a big stick. Now, gentlemen, we have made unto ourselves a Joss—and a very good Joss too, a sort of eight-headed affair, and we have appointed it to have dominion over us and regulate our goings and comings.

Now, so far this Joss of ours—this most excellent Board of Architects—has done very well. It has written all our names in a book, at some few guineas a time, and when we die it will call on us to "show cause" why our names should not be removed. And it has started to make us all better architects by selecting the cleverest graduates from our architectural schools, and sending them to Europe to collect all the information they can, and when they return they are to pass it on to us. So far, so good—and if one may venture on a comparison, very much better than any other registration body anywhere else, that one has heard of. There is one thing I should like to tell you, as it is not generally known.

An endowment fund has been started by members of the Board from their own fees. This will enable another student to go abroad, who would not otherwise be in a position to go. But, of course, we want more, and just because those of us with an established practice will not derive much benefit, we don't mind offering a few petitions without, of course, saying what will happen if our prayers are not answered. One thing we want is a few commandments on some such lines as these:

> Thou shalt not run a steam laundry, or an estate agency in connection with thy architectural practice.

and another equally valuable would be:

> Thou shalt not pretend to furnish plans for a sum which hardly represents the cost of the paper (because you must make it up somewhere, or you could not live, and it's a safe bet your client pays in the end, and through the nose at that.

And there is one more point more important still. What on earth is the good of having an educated body with a high and rigorous standard of professional qualifications laid down by law, if Municipal Councils are to be allowed to accept plans for approval by people without the slightest training in architecture?

Now, gentlemen, I feel sure the President of the Board, our friend Mr. Godsell, will tell us the Board will do these things as soon as it possibly can, and because we have every confidence in them, and know that they are to do just whatever they can for the advancement of the profession we love so well, I ask you to fill your glasses and drink to the Board of Architects of N.S.W.

MR. GODSELL: I must thank Mr. Day for the kind way in which he has proposed the toast of the Board of Architects. I do not think I would have been here to-night as its president if it had not been that my friend and I had not happened to meet Mr. Mutch one night, and discuss whether he would accept a bill which had been mutilated in the Upper House, or whether he would not. But with a little persuasion and his kind sense, and that of his successor, Mr. Bruntnell, it has been possible to make the bill operative, in consequence of which the Board was enabled to do perhaps something that had never been carried out in any State, and that was to form scholarships which have enabled us to send two students home every year with £400 a year. I wish to thank Mr. Mutch, not only for his advocacy of the Bill, but when his Government went out of office, and Mr. Bruntnell succeeded him (two great men, as you have heard before to-night, who ran education in all its branches, and did so much for this State), Mr. Mutch in Opposition, supported Mr. Bruntnell when he was in power. I can tell you, gentlemen, that our amendments were only achieved by my friend on my right giving us his whole-hearted support and that of his party, because he believed we were aiming for the right thing. There was a decided opposition before the last election to the course that the Board had pursued, when I was President of the Institute, and endeavoured to form an endowment fund. I said if I could not obtain the money that was necessary to place the education of architects in this State upon a firm basis by voluntary contribution, I would carry it through by Act of Parliament, and the consequence is my Board stood with me, and we adopted a registration fee of £3 3s., and an annual subscription of £2 2s. To-day we have, thanks to Mr. Bruntnell and Mr. Mutch, an endowment fund of £4000, and an annual income of £400. My Board never intended that that should be a charge for ever upon the architects of this State. The Board never intended the architects should be taxed at all, but they did intend to make the system of education secure. I say most earnestly, the Board was founded to regulate the practice of architecture, and I am sure the Government will assist in amending our Act in such a manner that unregistered men shall not be able to practise architecture under various titles of architect. We do not wish to make it a close profession, but we do wish to protect the public. We want to see the public obtain the best advice from all men alike who are admitted to the profession, and if the public likes to employ someone outside the profession, they shall absolutely know that they are not instructing someone who by virtue of calling himself an architectural draftsman pretends to have a standing, which he does not possess. The public shall not be misled, and they shall have the services of a qualified man to do their work when they require him. We are going to ask the Government to assist us, and I am sure the Government will know that our aim is not to form a close corporation, but for the benefit of the whole community. The Institute is for the purpose of reporting to the Board, which operates under the Act, misdemeanours and matters of unprofessional conduct which are committed by members or those outside..

MR. HOOK proposed the toast of "Kindred Societies:" Mr. President and Gentlemen, my position is very much like that of the old woman who lived in a shoe. There are about a dozen of these kindred societies, and I have to tell them all what good fellows they are. First, there is the Royal Society. You would not think there was much between these clever scientists who turn out papers on anatomy. We have something in common at any rate. I notice they often take these very learned papers as read, as we do our minutes. In any case, they are our landlords, so we must be very nice to them. Then there are our friends, the Royal Art Society and the Society of Artists. There is no profundity about these good people—there may be profanity sometimes. They do not take things as read. They paint them red at the Town Hall. Among our sister institutes we have the Surveyors, these mysterious weird sort of men, with their sines and cosines, triangles and other things, who know more than Mr. Euclid ever did. The Engineers, another mysterious crowd, with their volts and so on. The Master Builders are our "dearest" friends; where we would get without them, I have not the slightest idea; it may be up to the top of King Street. We love them all like brothers. There is the Historical Society, those people who put up these beautiful tablets on public houses. The Town Planners and the Sydney Regional Plan Convention who are trying to bring chaos out of order. If they had been with us 100 years ago, the work they could have done would have been very valuable indeed. I have much pleasure in proposing the toast of all these kindred societies.

PROFESSOR WATT: As the representative of the Royal Society of N.S.W., the leading kindred society, I thank the proposer of this toast. You will doubtless be expecting a very learned address from the representative of that society, but at such a late hour such a proceeding on my part would not be very popular. The proposer mentioned the fact that the Royal Society were the landlords of the Institute of Architects. In some parts of the world, more particularly the Emerald Isle, the relationships between landlords and tenants have not always been very pleasant. I am glad to say that, in spite of the very great architectural imperfections of our building, our tenants and ourselves have always been on the very best of terms, and the chances are that in the near future, we may be calling for their advice as to how to improve the architectural features of the building, and to make it worthy of the Royal Society of N.S.W. The Royal Society has a fine history, men who have made a world-wide reputation, men who have laid the foundations of many associations like Lawrence Hargraves, William Farrar, and Edgeworth David. I thank you for the way in which you have proposed the toast.

MR. BEDDIE: I am pleased to be here to-night as representing the Master Builders' Association, and to meet men who are rendering a great national service, and with the assistance of the builders erecting substantial monuments which will be handed down to future generations as proof of the ability of the architects of to-day. In these days of shortened hours of labour, it is very necessary that all economic waste should be cut out, and I would like to pay a tribute to the members of your Institute of a generation ago, who introduced the splendid system of contract and quantity, under which we at present work. There is no doubt that by taking out quantities, you get much more accurate results by giving the work to a competent surveyor who has specialised in that particular line, rather than submitting the plans and specifications to 20 or 30 builders who probably spend several days in taking out the quantities, and then with much less accuracy, with results well known to the architect and the builder. We think that the margin of contract of which quantities should be issued should be reduced to £1000. £2000 is too high. We are relying on the present Ministry to introduce some reduction into the Government Departments. During the past year we have been associated with many movements, including the cricket and bowling matches. I hope during the next year there will be a great many more contracts signed. I thank you, gentlemen, for the way in which you have honoured the toast.

MR. HALLORAN: On behalf of the Royal Historical Society, allow me to thank you heartily for the welcome you have given us. The proposer of the toast, Mr. Hook, said we were chiefly celebrated for the placing of tablets on pubs. If Mr. Hook will only show me where we have placed a tablet on a pub, I will give him £5 to-morrow. Our society is prospering. We have 1000 subscribing members, and we do not wander about thinking of things of the past merely, but we do wander about throughout the length and breadth of Australia, and when the various Governments of Australia ask for information as to the historical interest of any particular place, the members of the Historical Society go to infinite pains to find it for them, and the Government, both Federal and State, invariably adopt any suggestion from our society.

DR. PURDY proposed the toast of the President, Sir Charles Rosenthal. I hoped that I might have been amongst the "also rans," but I welcome this opportunity of replying to the toast proposed by Mr. Hook. Sir Charles Rosenthal will remember the inception of a paper known as "Aussie" during the war. I was asked to send a few little anecdotes, and when I did, they would not publish them. The Israelites, when they captured Jericho, encompassed the city, blowing their trumpets, and marching round the city, and at the seventh blow the walls fell, but when the Australians arrived Jericho fell at the first blow. Association with Australians has made me rather addicted to blow, and I have had good occasion to blow since I came to Sydney, because I have the privilege of being medical officer of a great city, with a great population of a million people, and we have the lowest death rate of any city in the world. I think Mr. Mutch paid a wonderful compliment to his predecessor, and also to your respected President. Among those who fell by the wayside at the last elections, there are many more who could have been better spared than your distinguished President. Before proposing this toast, I would like to tell Mr. Hook that there were town planners in Sydney 100 years ago. Governor Macquarie was the Rameses II. of N.S.W., and there was Sir Thomas Mitchell. If his ideas had been carried out, and if the people of 1825 had had the same vision as he had, Sydney to-day would have been a city worthy of its wonderful setting. I ask you to join with me in drinking the toast of our President, a distinguished soldier, a distinguished architect, and a citizen who has done good and worthy service to the city and the State. I am sure that if ever the occasion arises, when Australia has again to defend her position in the Pacific or to join with the other members of the overseas dominions to assist the mother country, we are fortunate, as far as Australia is concerned, in having two such eminent men as Sir John Monash and Sir Charles Rosenthal.

SIR CHARLES ROSENTHAL briefly returned thanks.

THE LATE MR. H. C. DAY

We regret to announce the accidental death, on 2nd August, of Mr. Harry Cooper Day, Hon. Secretary of the Institute.

ENGINEERING SECTION

CONDUCTED BY "BUTTRESS"

STEEL CONSTRUCTION OBSERVANCES

In steel-framed construction there are essential points to be watched, just as in Reinforced Concrete construction observances, which we discussed in our June issue.

It is here assumed that the structure has been properly designed and that the shop work has been properly executed. It should be emphasised at this point that shop inspection in connection with steel construction is very important as in fabricating if there is no inspection, the plans may not be followed correctly, causing delay and expensive field charges at the site, and certain errors of fabrication are not apparent until after it is completed. Now, supposing the steel has been shipped in perfect order, and is arriving on the site, the Inspector should first look over for damages due to transport. Then these will generally appear as bent plates or members. All these damages should be rectified by straightening, and if necessary, by reinforcing before erection is allowed to proceed. Should there be no shop inspection in every case the Field Inspector should go over the riveting and see that surfaces in direct bearing are milled, and in contact.

The important thing in the erection of bases, if of grillage type, consisting of Rolled Steel Beams, which type is occasionally resorted to, but which are now rarely seen in this city, is to see that they are properly grouted. When the steel is beginning to be erected the inspector should keep in mind the fence of the connections, and the way all stresses are carried from one member into another. This will put him in a position to take the work up in a practical manner. For instance, he will notice that some steel beams rise upon seats, which were riveted up in the shop. The additional field rivets are really for the purpose of holding the beam in place, and not to take the load. At this stage it is worthy to note that steel angles as seats are a direct advantage in erection. and should always be adopted in preference to cleated webs of beams only. Other connections will be made directly from the beam through the connection angles to the column or girder by means of field bolts or rivets. Riveting should be done for a firstclass job, but if it is desired to lessen the cost bolting can be resorted to satisfactorily, but one must always understand that it is a firstclass job. It will be readily seen that the rivets or bolts in this connection are very much more important, and should be more carefully inspected than the field rivets in seat connection.

The inspector should bear in mind that a rivet is supposed to hold by its shearing and bearing, and that it also performs a very important function, if tight, in holding the two surface beams and producing friction resistance between the plates. Points to be looked at in observation of steel erection are namely:—

1. The process of riveting induces a certain amount of internal tension in the shank of the rivet, and therefore renders the rivet unreliable for additional tensile strain, and therefore bolts with lock nuts should always be substituted for any rivets that are supposed to act in tension.

2. All holes in plates should be concentric. The use of a drift pin to make the holes concentric by forcing action is to be condemned, also the cutting of extra holes by means of an electric or other torch.

3. All loose rivets should be cut out on the end. Cracking with hammer and chisel, causing a wedge connection under the rivet head should not be tolerated.

Rivets may have the fault of too short a stock, and heads will be flat, but this should not be confused with heads, which are purposely countersunk for clearance. The testing of such loose rivets could be best done with a small hammer, observation being made to see if there is any vibration.

4. Above all sizes and weights of beams called for on the plans should be accurately noted by the Inspector, and the bearing of this on masonry or other walls should be carefully looked to.

5. After erection painting is a very important matter in the preservation of steel work, and all portions where paint has been removed by shipment should be repainted before erection, and the field coat should be a different colour to the shop coat.

6. Inspection should at intervals be made not only by the Superintending Architect or Engineer, but also by the designer himself, as designers have certain intentions when carrying into effect a design which frequently are not brought out on the job.

7. The guying and bracing of steel in the process of erection against wind bracing is important, and should not be overlooked by any inspector, for erection strains frequently are greater than ever, and serious accidents to persons and material have occurred through inadequate guying. Even the shrinkage of guy ropes when wet have been known to cause trouble. To summarise these few remarks we may bear in mind these clauses:—

(a) See that your steel is inspected by a competent man at the shop.

(b) See that your bases have proper contact.

(c) See that columns bear directly on bases with full bearings, and that all stiffeners of the steel work are milled to bear.

(d) See that the steel is repaired and straightened where injured during shipment.

(e) See that all rivets are tight and driven in concentric holes.

(f) Be sure that beams have proper steel bearings.

(g) Take care to have a good two-coat paint job.

(h) Finally guard your steelwork against accidents during erection, for your design not only means guarding against failures on completion, but also of failures at the time of erection.

FOUNDATIONS

Foundation problems in and around Sydney vary quite considerably, and each case presents almost a different problem. We have sandy, clay, and rocky sites, and, again, very unstable sites that require either pile or raft construction. Around our foreshores the use of timber piling has been mainly resorted to—in the city proper we have a variety of types of foundations.

In sites surrounding the old Tank Stream we have to resort to piers being driven down to a hard foundation many feet down, and the spaces between piers spanned by reinforced concrete beams. Further to the South, where much clay exists, we are resorting to raft construction, or go down to the hard shale with the foundation bases of our columns.

Compact shale is a good foundation if not exposed to the atmosphere for a very long period.

The main requirement in dealing with the foundations is to ascertain correctly by trial holes the nature of the sub-soil, so as to enable the method of load distribution to be decided upon.

The raft system of foundations is one that has in the last few years been resorted to very much on poor sub-soil, and is usually constructed of reinforced concrete. In reality, it forms the case of an inverted floor as regards the loading; the object in view is to prevent the soil from spreading out under the load and to make the foundation in the form of a stiff plate in which no part can sink relatively to any other part, but so that it can only sink or tip as a whole. As the first object of a raft foundation is to ensure equal subsidence, it is quite clear that the soil must be prevented from spreading under the load at the outside edge. This is usually done by making the outside beams of this inverted floor system deeper than the inside.

A raft construction composed of slabs and beams is often more economical than piling, but where heavy concentrated loads occur the latter is preferable.

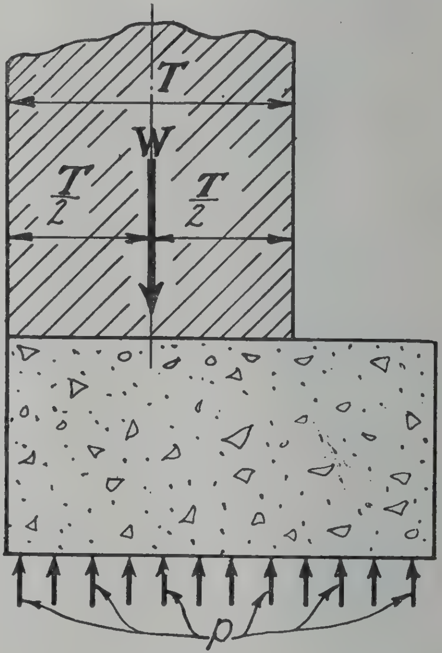


FIG. 3

ECCENTRICALLY LOADED WALL FOOTING.

The system of pier and lintel construction to prevent subsidence is a method that ought always to be adopted on a sub-soil of clay, which is always likely to become unstable. Such a construction ensures, even in domestic work, a sound building without cracks, provided the piers go to a solid stratum.

Foundation costs are always high, and owners frequently feel that much money sunk underground appears lost, but if such is carried out efficiently, it is money well spent.

Many types of foundations occur in Sydney, and are treated according to the general nature of the construction; but for buildings of a moderate height and not of skeleton construction, where loads are concentrated as point loads requiring special treatment, the eccentric loaded spread footing forms an interesting example to be considered when wall footings are located on a lot line.

A common practice is to make the footing anywhere from 6 inches to 2 feet wider than the basement wall, and assume that all requirements for a safe footing have been complied with.

Consideration will be given to a problem involving this type of spread footing.

Let us assume a four-storey factory with bearing walls and wood floor joists having a clear span of 24 feet. Assume that the live load is 120 pounds and the dead load 20 pounds per sq. ft. For the roof a live load of 40 pounds and a dead load of 15 pounds per sq. ft. will be assumed. The wall thickness and storey heights are taken as indicated on the sketch. The total load coming on the soil at the footing level will be 9.1 tons per linear foot of wall, computed as follows:—

Floor and Roof Load.

	Width		Length			Load per sq. ft.		Total Load
Floors—	4	x	1	x	12	(120 + 20)	=	6,720 lbs.
Roof—	1	x	12			(40 + 15)	=	660 lbs.

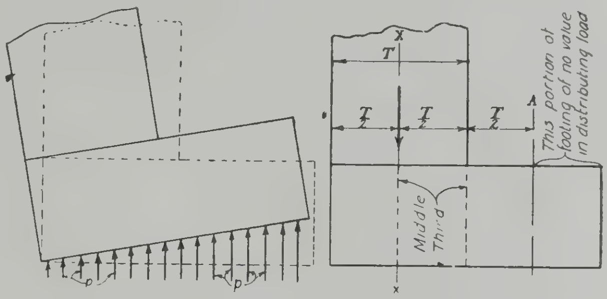
Wall Load.

	Thickness		Length		Height		Wt. per cu. ft.		
Parapet—	2/3	x	1	x	2	x	120	=	160 lbs.
Fourth Storey—	1	x	1	x	12	x	120	=	1,440 lbs.
Three Lower Storeys—	1.33	x	1	x	36	x	120	=	5,760 lbs.
Basement—	2	x	1	x	10	x	150	=	3,000 lbs.
									17,740 lbs.
Assume weight of footings									460 lbs.
Total load on soil									18.200 lbs.

Or 9.1 tons per linear foot of wall.

For a wall two feet thick, the maximum footing projection permitted by good practice for an eccentric footing is one foot. It might here be well to correct an erroneous impression as to the effectiveness in distributing load produced by extending the footing projection on one side only.

Let W be the total load of the wall, floor, etc., which for analysis may be assumed to act through the centre of gravity, for the problem under consideration would be a lengthy calculation, but an inspection would indicate that it is near the centre of the basement wall, and it will be so assumed.

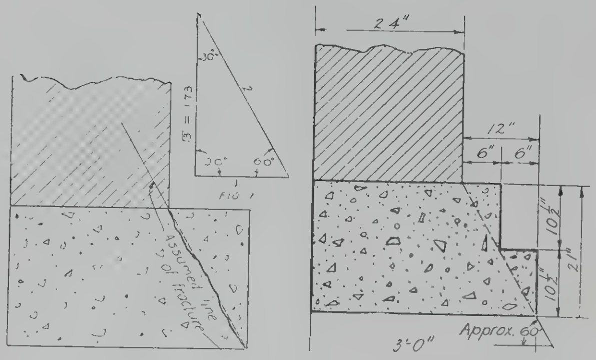


LOADING OF AN ECCENTRIC FOOTING.

This force must be resisted by the upward pressure of the soil, and this pressure per unit area will be designated as P. Now, if the footing were extended a considerable distance, and it were possible to obtain a distribution of load over the entire spread, it will be seen that this upward pressure would cause an unbalanced overturning moment on the wall producing rotation, as shown. This condition, however, is not possible; and what actually occurs is a decrease in the intensity of pressure until zero is reached, as shown. It will thus be seen that any projection placed beyond the line A—A is worthless, and a waste of material; further than that, it is positively detrimental, since it tends to produce rotation when settlement occurs. When the centre of gravity of the load comes at the centre of the wall, the maximum projection can only be equal to one-half of the width of the wall. Under these conditions the line of resultant pressure does not fall outside the middle third of the footing. Whenever this resultant force falls without the middle third, tension occurs at the extension of the footing.

Thus, for the problem under consideration, the maximum projection will be $\frac{1}{2}$ of 2 feet, or 12 inches, and the total width of footing will be 3 feet. Since the load to be carried is 9.1 tons per linear foot, the *average* load on the soil will be 9.1 divided by 3 equals 3.03 tons per sq. foot. It will be noted that this intensity of pressure is not uniformly distributed over the soil under these conditions, although if the soil is considered as capable of supporting a uniform load in excess of 3 tons per sq. foot this foundation can be considered as safe to use.

Unless reinforcing steel is used, the thickness of the footing is determined by the rule that the line of fracture of the material will make an angle of



DISPERSION IN AN ECCENTRIC FOOTING.

approximately 60 degrees with the horizontal. The sides of a 30 degree and 60 degree right triangle are in the ratio of 1: 3: 2, as shown. It will be noted that the vertical leg is 1.73 times the horizontal one. Since the former represents the thickness and the latter the projection, the thickness should be made approximately $1\frac{3}{4}$ times the projection. For this problem, as the offset is 12 inches, the thickness should be $1\frac{3}{4}$ x 12 x 21 inches. For economy the footing should be stepped up as shown. In case the soil were of such nature as to be unable to support a loading of over three tons per square foot, it would then be necessary to either excavate to a firmer strata or drive piles. If ground water were encountered at the footing level, wood piles should, under most conditions, prove the most economical, otherwise the choice would lie between concrete piles and deeper excavation, unless it were possible to offset the wall so as to make the construction of a concentric footing possible. It is usually the case that the value of the lost floor space due to offsetting the wall is greater than the increased cost of pile or other footings.

BROAD FLANGE BEAMS

In our June issue we made reference to Broad Flange Beams for Structural Steel construction—a review being given of the Handbook of R. A. Skelton & Co., of London, who manufacture these beams. We have been advised by the official stockholders in this city, Messrs. Luke Muras Ltd., that although three grades of Beams in this material are recorded in the handbook, the only grade handled by them is

> "Standard Quality, having a tensile strength of 26 to 30 tons per square inch, with 20 per cent. elongation in 8 inches, but material to British Standard Specification, with a tensile strength of 28 to 33 tons per square inch, can be supplied when authority calls for same. The furnishing of test certificates is guaranteed in every case."

REVIEW OF ENGINEERING BOOKS AND PERIODICALS

1.—TABLES OF STEEL COMPOUND GIRDERS.

(F. B. MASON—Chapman & Hall Publication.)

This compilation of 126 pages of tables forms an interesting and valuable collection of matter that should prove to be of use to engineers engaged on structural steel design.

They form a more complete range of values than are usually found in Manufacturers' Handbooks. The girders tabulated are composed of both single, double and treble I-beams, and a wide range of flange plate widths is given—thicknesses given vary for each flange plate from ⅜in. to 3in.

The author has been wise in including compound sections for both old and new B.S. Beams, as old sections are likely to be available for some years. The old and new sections are grouped separately, and full dimensions and properties are given for a 7½ tons stress. The inclusion of Maximum Shear Values without Stiffeners, the Minimum Span without Stiffeners, and the Number of Rivets for Nett Area of flats should be useful.

The load carrying capacity of the compound girders is obtained by dividing a given "Coefficient for load as beam" by the span—this coefficient corresponding to the safe uniformly distributed load on one foot span. The book is well produced, and readers can be assured to the values being thoroughly checked and free from typographical errors, as the tables are in the form of the compiler's original manuscript—such an arrangement is not common, but it is useful in preventing compositors' mistakes, which so often occur.

In our last issue we reviewed a Set of Tables for R.C. Floors and Roofs—these tables of Girders form a very valuable companion to them.

2.—HANDBOOK OF STRUCTURAL STEELWORK.

(Messrs. Redpath, Brown & Co. Ltd., Edinburgh.)
(Our copy from James Hurll & Co. Ltd.)

This handbook is a 1924 edition, being a reprint of 1915 edition, but is accompanied by a pamphlet relating to the New B.S. Sections of 1920.

Messrs. Redpath, Brown need no introduction to readers, as their structural steelwork is well known to all who have been in the United Kingdom, or have perused Overseas Technical Journals. The Bank of England, Peter Robinson's Store, and Australia House, London, and many other buildings, are "Clothings" to the steel skeleton framework of this Company.

Many designers of steelwork have been accustomed to use this handbook, but perhaps not so much in this State until the past few months, when the handbook has been more readily obtainable.

The vast collection of data in this volume is quite an equal to that in the handbook of any other Steel Manufacturers. The last part of the handbook has the letterpress printed in green, to denote properties and loading of sections designed in accordance with the London County Council Act, which governs all structural steel design in London, where, universally, structural steel is employed for all its skeleton framed buildings.

The pamphlet accompanying gives detailed properties of the New Sections, and both these books must be useful on the bookshelves of any designer.

3.—CONCRETE CONSTRUCTION FOR ARCHITECTS.

(DE WITT C. POND—Charles Scribner & Sons, New York, Publishers.)

Some few years ago the author of this book, Mr. De Witt Pond, produced "Engineering for Architects," a complete little book relating to structural mechanics and elementary steel design, which met with much success in the U.S.A.

The author is well known as a constant contributor to "Architecture" of New York, published by the publishers of "Concrete Construction." The book shelves of our technical booksellers contain many books relating to Reinforced Concrete, but all of them are written for the Engineer, who is the person who rightly designs the structural portion of our buildings. This fact, however, should not prevent the Architect knowing something about design in this material. Mr. Pond has endeavoured to place before the Architect the principles of Reinforced Concrete, and has given his methods of designing.

This he has done admirably, and has included many rules governing such design in accordance with the New York Building Code and the Joint Committee of the American Society of Civil Engineers.

First, a treatment of Moments and Shears is given, then Slabs, Beams, Girders, Columns, Footings, and general details of Flat Slab construction, embodying "Mushroom-headed" columns.

In the final chapters, practical application of foregoing principles is made—the detailed design of a Hudson Street Building, Manhattan by McKenzie, Voorhees & Sinclair, Architects, being given.

The book throughout tends to be very practical, and is based entirely on U.S.A. Practice. Architects should glean from such a book much interesting and helpful information; only the simplest of mathematics is included, and there is no terrifying nomenclature throughout, as is to be found in some text books and city regulations.

Reinforced Concrete plays an important part in our community, and Architects should be *au fait* with parts of such construction, more from the combined arrangement of steel and concrete than with actual design.

Unfortunately the book does not give a large number of R.C. Drawings, showing the position of reinforcement, etc., and no index is given to the various sections, sub-sections, and details of the text at the end, which would facilitate reference.

However, the title should attract Architects, and if it does, they ought to gain much knowledge from a reading of this book.

ARCHITECTURE, HYGIENE AND CHEMISTRY

O. A. MENDLESOHN, B.Sc., F.C.S., A.A.C.I.

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ARCHITECTS and engineers, like to all other scientists, set the whole of their work and studies upon the firm foundation of belief that the natural world is not a higgledy-piggledy, chaotic mass, but on the contrary is orderly and conformable to what we vaguely call "natural law." The student of elementary physics learns very early that every particle of matter in the universe reacts upon every other particle, as seen in gravitational attraction: and between every object and every occupation there is, we realise, some more or less close relationship.

I was particularly interested in reading the views of Mr. Waterhouse, in the May number of "Architecture," upon the relations of the structural engineer and the architect, and I suppose there are few members of your profession who will not agree that, far from being an interloper and a half-baked competitor, the structural engineer should be received with respect as a colleague.

We chemists belong to a calling which allies itself, and fringes on, and contributes to, and be it admitted, sometimes awkwardly pokes its nose into almost every other profession and trade. Chemistry, as one of the fundamental sciences, recognises no sharply defined boundaries, and its connection with architecture, though somewhat obscure, is none the less real and important.

The artist mixes his pigments with brains, and with brains the architect moulds his stone and timber and bricks and metals into a house or a cathedral. Modern chemistry has given the artist pigments immensely superior in brilliancy and permanency than any Leonardo da Vinci ever possessed, and it has given to the architect and engineer raw materials for construction immeasurably better than your Christopher Wren ever knew. In these responsible days, the premature disintegration of a structure would be a serious reflection upon the not-too-modest claims of the chemist.

But apart from supplying architecture with better raw materials for its art, there is a less obvious, but not less important, relation between the architect and the chemist. This lies within the realm of hygiene. I suppose the prime necessities of any structure are firstly that it be hygienic and secondly beautiful. In the domain of hygiene, adequate supplies of pure air and water must enter a building, and harmful waste matter, including polluted air and water, garbage and sewage, must be rapidly and efficiently removed. To the individual architectural practitioner these problems do not require very much thought in the case of structures in cities. A supply of pure water is available by connecting to the main, sewage is removable by a similar process, and after the garbage man has carted away the waste, neither the architect nor his client need worry further.

Once the architect has made adequate arrangement for the correct distribution or removal from the building, he has fulfilled his function.

But Australians beyond the cities are no longer content to envy city dwellers their hygienic treasures. They demand them, and country dwelling Australians are well able to pay for them. Here the architect will wisely use the chemist and the chemical engineer.

The chemistry of hygiene is a sub-branch of that great division of our science we call bio-chemistry. Its boundaries are a little vague, but it is essentially concerned with the chemical changes taking place in living animals and plants, as the result of vital activities or metabolism. At first sight there would appear little direct connection between this, and the supply of pure water, and the efficient treatment of sewage, but one has to bear in mind that on the one hand, contaminated and impure water is such because of the presence of pathogenic bacteria and their food supply, and on the other, incomparably the best process of treating sewage yet discovered, is to create favourable conditions for suitable bacteria to decompose it. It follows that bio-chemistry here merges into bacteriology.

So, in effect, the chemist says to the architect: "This water is of sufficient organic purity for human consumption," or "This water contains such and such impurities, and so many bacteria of this and that harmful type. The remedial measures to render it safe and palatable are outlined." With this data, the architect and engineer may step in the arena, and fight their battle in the cause of health and efficiency.

In the case of sewage treatment, extensive preliminary investigational work is rarely necessary. The bio-chemical treatment has been well investigated, and the method is a stock one. The architect has the general data, and usually and wisely relies upon the hygienic engineer to construct and accept responsibility for the installation of a modern plant.

So much for generalities. In my next article I shall use my space to deal a little more specifically with the actual chemical principles involved in water, sewage, and air treatment.

NOTICE TO ARCHITECTS

ROYAL INSTITUTE OF BRITISH ARCHITECTS

PRIZES AND STUDENTSHIPS—1925-1962

For details call at the office of the Institute of
Architects of New South Wales, Elizabeth St.

ARCHITECTURE

THE JOURNAL OF PROCEEDINGS OF THE INSTITUTE OF ARCHITECTS OF NEW SOUTH WALES

Vol. 14. No. 9.
Registered at the G.P.O., Sydney, for transmission by post as a newspaper.
September, 1925

THE AUTOGRAPHING OF AUSTRALIAN BUILDINGS

The signing of buildings by Architects has in the past in all countries been a practice of undivided action, and although the question of placing the name of an Architect on the edifice he conceives has been thoroughly discussed in the councils of the profession, no definite move has ever been taken to have this practice regularly carried into effect. No objections of consequence have been recorded against the practice, and it appears that the creation of this custom by all Architects would do much to improve the public interest in a country's buildings which express the life of the people of the age.

In this city there are a few examples of buildings where the Architect's name appears on a metal plate at the entrance to the building, but it is not in the same part of the building in each instance which it appears should be so, just as we expect in the case of a painter's finished works.

The question of this signing of buildings by Architects is not one of professional self-exploitation, as one might expect to find in commercial undertakings, but a custom that if once firmly established would go far toward making generally known the names of Architects who are responsible for each structure erected. Painters and Sculptors have their names recorded on their conceptions; therefore, it appears that Architects who are followers of an Art—The Mistress Art—should rightly sign their works.

In Australia the practice has been very little resorted to, perhaps owing to the lead not having been given by other countries, but that is little reason for her Architecture not revealing the names of its creators.

The Architects of the United States, Great Britain and various Continental Countries are now beginning to resort to this practice of signing buildings, and in Kingsway, London, very many of the new buildings have the Architect's name recorded on them.

This proposed record of an Architect's skill is no new one, but one resorted to in both the eighteenth and nineteenth centuries, and on various Town Houses of both Paris and London, these records have been made. Architecture is at last beginning to be recognised as playing an important part in man's environment, and it seems as though we can, by this practice, enable a greater interest to be taken in the works of the designers of our buildings, just as the public takes an interest in the creation of a picture of a new artist or the work of a fresh sculptor.

In this State we hold Architectural exhibitions annually to show the public what Architects create around them, to interest them in an art that influences their lives and their work. People see a new picture they ask for its originator; they see a new building—how many ask of its designer? Yet such creations are around them, and they see them not! It is a great pity that the man in the street does not take it upon himself to feel his city's Architecture is his own. He goes to see an artist's picture which is recorded in the press with an outline of the Artist's earlier works. How much prominence does the daily press give to an account of a completed building and its designer? The press do not tell the public who creates the edifices around them, so let Architects tell the public themselves. Good and bad Architecture form part of every city, and one does not suggest that the bad goes unsigned, and the good be noted—let it all be known. One of the punishments the "Mistress Art" deals out to its makers of failures is perpetual memory. Doctors' mistakes and Lawyers' mistakes fade away, but an Architect's remain before all generations for almost eternity, and with a signed building they suffer their deserts.

PROFESSOR LESLIE WILKINSON

Professor Leslie Wilkinson, Dean of the Faculty of Architecture, who left for England by the "Chitral" on the 26th inst., was given a farewell dinner at the "Horseshoe" Cafe, by the Council and Members of the Institute, on Monday evening, the 24th inst.

Thirty members attended and the dinner was a delightful little function. Sir Charles Rosenthal was in the chair, and spoke appreciatively of the excellent work Professor Wilkinson had done during the past seven years, and wished him "bon-voyage," expressing the hope that the rumour that the Professor did not intend to return was groundless.

A presentation was made on behalf of the Council and Members, of a suitably inscribed silver match-box cover and a box of cigars. Professor Wilkinson recorded the pleasure he had had in his sojourn amongst Architects in Sydney for the past seven years, and declared his intention to return.

HARRY COOPER DAY

The passing of Harry Cooper Day at the early age of 37 removes from the activities of the Institute an architect who was whole-heartedly loyal to the interests of the profession. His energy and activity as Honorary Secretary, and his enthusiasm in connection with Council affairs and the annual exhibition, for many years, acted as an incentive to every member of the Council, and the Exhibition Committee in particular.

His cheery presence will be missed acutely, but memory of a charming personality will remain green for many years to come.

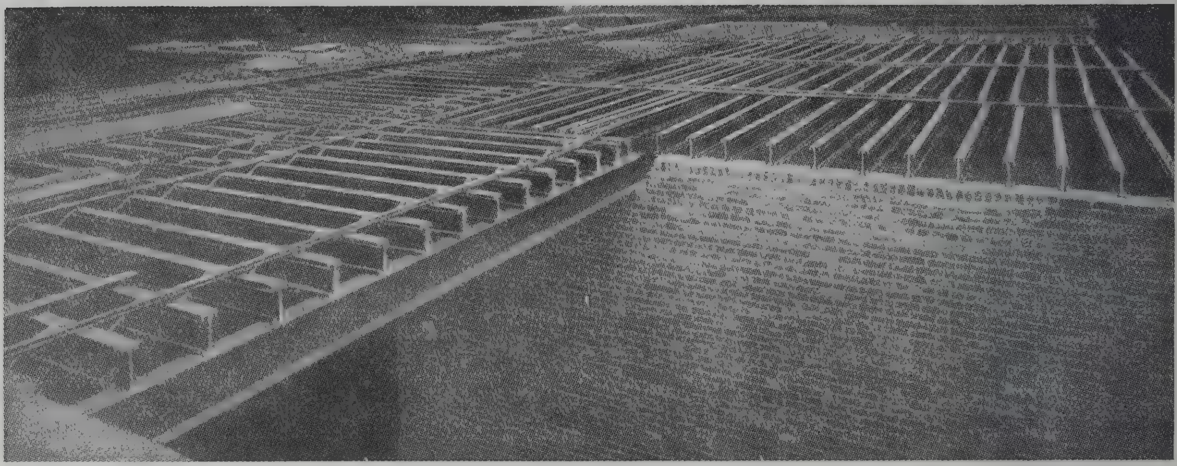
Those who enjoyed his intimate friendship record a disposition extremely considerate and delightfully unaffected, with a thought always for "the other fellow."

Harry Day was exceedingly keen to succeed in his profession, and his work conveyed every indication of knowledge, interest and enthusiasm, and had he been spared there is no doubt that his work, which for some years past gave evidence of individuality, would have secured for him recognition as a talented exponent of the art he loved so well.

Sir Charles Rosenthal loses a partner whose place it will be very difficult to fill—to him we offer our sympathy.

To his wife and three children who suffer such an irreparable loss, every member of the Institute extends expressions of the deepest solicitude. Harry Cooper Day was born at Pennant Hills 37 years ago. He was educated at the Church of England Grammar School, North Sydney, and gained his first architectural experience in the office of his father, Mr. M. Cooper Day. He was married in 1915, and leaves a widow and three children.

ENGINEERING SECTION
CONDUCTED BY "BUTTRESS"



LIGHT METAL LUMBER JOISTS READY TO RECEIVE THE METAL LATHED COVERING WHICH CARRIES THE CONCRETE FLOOR.

METAL LUMBER

This is a structural material that has not been used in this country up to the present, but which will perhaps find its way on to the market when its merits are established.

The U.S.A. have found much use for it as a material in floors and partitions, and with the decreased dead load its use appears to be very satisfactory.

Metal lumber as this system of pressed steel joists and studs used as load carrying members installed in conjunction with concrete and plaster is called. furnishes some advantages compared with other fireproof constructions. It is used in conjunction with steel framed skeleton construction or brick walls; the plastered ceiling fixed to metal lathings below the metal joists appears to be the only weak point of the construction. Lighter dead loads occur, resulting in saving throughout the building, including the superstructure and footings.

Great speed and adaptability in erection and small labour cost is another advantage. The structural shapes, as here illustrated, are fabricated from rolled sheets and, generally, in forms similar to rolled structural shapes. Primarily they were designed to replace wooden joists and studs with similar parts made of incombustible material. While the initial intention was to make the buildings that usually are constructed with wooden joists and studs more fire-resisting, it has developed that in a greater field. Like all other materials and constructions, it has limitations of use which are determined by its physical properties and economic considerations. To better appreciate these limitations a general description is here given.

The basic section is that of a channel beam, from which 1-beam sections are made by riveting the channels together back to back. The studs are of channel U and T shapes. These sections were first formed on a brake, each separate bend being a distinct operation. The length of the section, without splices, was controlled by the length of the brake. This length was generally 16 feet 8 inches. Sections were spliced in such a manner as to provide any length for which the cross section was suitable. These splices were designed in such a manner as to develop 25 per cent. more strength than the balance of the section. A later development in the fabrication of these sections is in making the splices by electric welding.

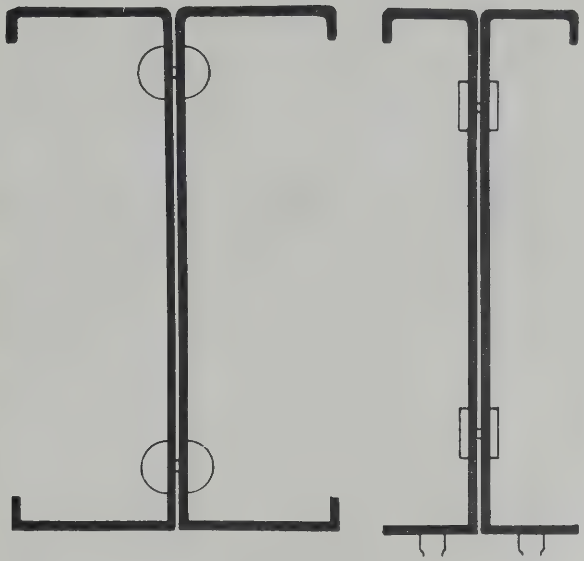
It is understood that all rolled steel sections are subject to internal stresses, which are inherent from the nature of the production process. Some en-

UNDERSIDE OF FLOOR SHOWING THE JOISTS OF METAL LUMBER.

gineers attribute the comparatively easy destruction of rolled structural shapes, under comparatively low temperatures, to these internal stresses. The correctness of this theory is debatable. Rolled sheets have these same internal stresses in some degree, and also the usual distinct grain parallel to the rolling. When such a sheet is fabricated in a brake there is a weakening of the material at the bends; this is also the case when the shaping of the material is done by forming rolls, which are now used for this purpose to a large extent. To overcome this difficulty the sheets are cut to suitable lengths and re-rolled in a direction at right angles to the original rolling. The result is a fine double grain material. The material, re-rolled and annealed, is uniform in texture, and in repose from internal stresses. The sheets used for this purpose are not ordinary commercial sheets, but those made to special specification requirements. Fire tests indicate some greater resistance to the effects of high temperatures than is found in the rolled structural shapes, but this does not absolve this material from the necessity for adequate protection from fire.

The spacing of the joists varies from 16in. to 24in.; the system is entirely fire-resisting for the reason that primarily the material is metal, and, therefore, incombustible. With its greater strength, these two qualities are the main advantages over wood construction. It is necessary, however, to protect the metal from high temperatures resulting from the burning contents of the building. This protection is provided by the concrete floor construction and the metal lath and plaster ceiling. The ceiling is, naturally, the most vulnerable point, and the protection is limited by the fire-resisting ability of the plastering.

The fire tests on this construction indicate that it will withstand a temperature of 1700 deg. Fahr. maintained for four hours. Naturally this result is obtained only by virtue of the plastering on the ceiling, as without this protection the construction would fail. It is unfortunate that in these tests temperatures of the steel joists and the air space between the ceiling and floor construction were not obtained. This data would be a valuable aid in forming conclusions for conditions other than those under which the tests were made. In this case the cement plastering was 1 inch thick, and made of a 1-2½ mix. Its insulating value would vary directly as its thickness. As before stated, the quality of the plastering is a very important element in the fire-resisting ability of this type of construction.

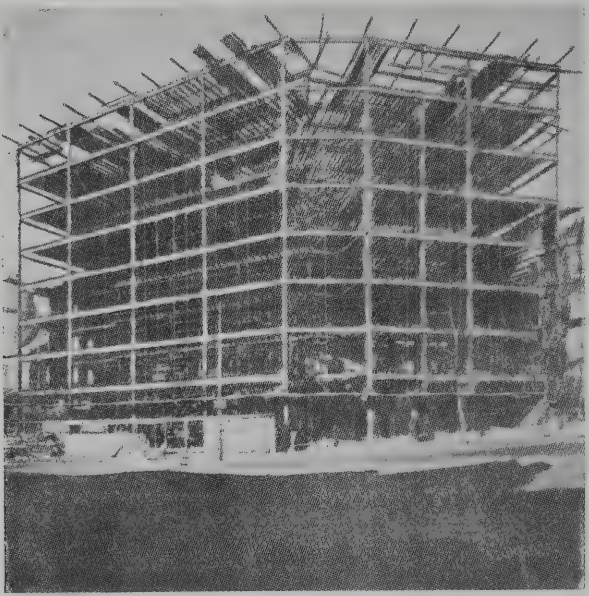


METAL LUMBER JOIST SECTIONS OF ROLLED STEEL SHEETS.

The fire-resisting ability of this type of construction limits its use, except in sprinklered buildings, to those that do not contain large amounts of combustible contents, such as residences, schoolhouses, apartments, hotels, office buildings and some classes of mercantile occupancy. The mercantile occupancies would be those in which the stocks were of fairly incombustible goods and of light weight.

It is apparent that these floors are not adapted for what is known as "heavy duty" floors, but are commercially possible for light live loads. The structural, fire-resisting and economic limitations are light live loads, medium spans and minimum fire temperatures due to the burning of combustible contents.

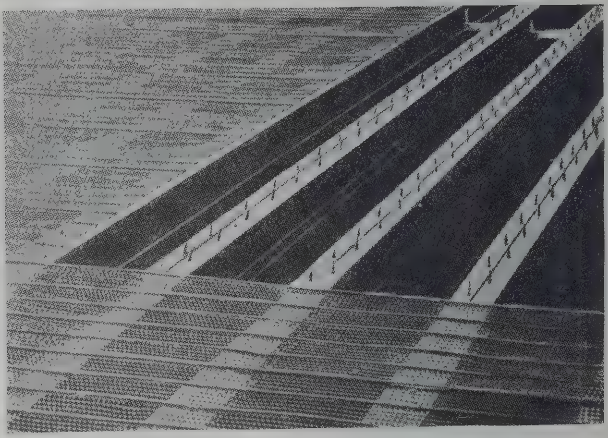
One of the great economies in the use of this material is due to the lightness of the material and the construction. With few exceptions, fire-resisting floors have a dead weight of from 70 to 125 pounds per square foot. This type of construction weighs from 32 to 40 pounds per square foot, and is one



A STEEL-FRAMED BUILDING IN U.S.A. WITH 8 FLOORS AND ROOF OF METAL LUMBER, 90,000 SQ. FT. OF AREA.

of the few fire-resisting constructions in which the live and dead loads are approximately equal in the class of buildings above mentioned.

This element of lightness permits of the use of lighter girders, columns and foundations, and is one of the principal factors in the cost savings effected by the use of this material. The supporting girders and columns can be made of reinforced concrete or structural steel. In case concrete girders are used they are "T" shaped, and into the flanges of which the ends of the metal joists are incorporated and anchored, either into the girder or the opposite joist when there is one. When structural steel girders are used, the joists bear on angle iron seats or are hung in stirrups and anchored to the girder. When the joists rest on top of the girders a sheet of metal seat is provided, which clips on to the joist and the girder.



METAL LUMBER SUPPORTING METAL LATHING.

It is unfortunate that the production of this material is not standardized in the same manner that structural steel shapes are standardized. As it is, each manufacturer has his own standards, and the differences are not of sufficient importance to preclude the possibility of uniform standards. Designing data is furnished by the manufacturers, which enables architects and engineers to design for the use of the material. For competitive purposes, the architect who produces his own structural designs will be compelled to make two or more designs or accept those provided by the manufacturer. Many architects and engineers prefer to have entire control of the design, and rightly so, and this condition of non-standardization hinders the use of this material, in the same manner that the use of structural wrought iron was affected when each rolling mill had its own individual shapes.

The use of this material is becoming more common as its availability from a structural and economic viewpoint is better known. It is found that its cost in U.S.A. very closely approximates that of wood construction, giving the added and desirable quality of great resistance to destruction by fire. In these times, when justifiable economies are sought and studied, this material is well worthy of careful consideration.

REVIEW *of* ENGINEERING BOOKS *and* PERIODICALS

1. SIMPLE EXAMPLES OF REINFORCED CONCRETE DESIGN.

Dr. Oscar Faber, Oxford University Press Publication.

THIS collection of 84 pages of calculations relating to structural elements in reinforced concrete forms a useful guide to students and others engaged in design.

Typical examples of structures and portions of buildings of reinforced concrete are treated in a manner well explained without the use of any higher mathematics. Examples given are for a Circular and Square Water Tank, a Warehouse embodying one example of slabs, beams, girders, columns and column footings, also a retaining wall and an elevated tank. The problems are considered as elementary practical examples of what the structural engineer has to solve in both architectural and engineering operations.

These examples first appeared in serial form in *Concrete and Constructional Engineering,* of London, but Dr. Faber has now collected them in a form suitable for the designers' bookshelf. Dr. Faber's contributions to reinforced concrete design are well known to engineers; he has investigated column analysis greatly and his method of considering bending in columns, as well as direct loading, is taken up in these examples. The author is the lecturer in Structural design at the Architectural Association School in London and is the structural engineer for the new Bank of England building. All those engaged in actual design as well as students will glean much from these solutions of practical structural problems.

2. STRUCTURAL ENGINEERS' HANDBOOK.

Milo S. Ketchum, C.E.
McGraw-Hill Book Co. Publication.

This latest edition (third) of the Structural Engineer's Handbook once more places before us a vast collection of structural data. Periodically from the printing press of technical publishers in U.S.A. we receive their masses of literature appertaining to structural design in both steel and concrete. The publishers of this book are amongst the leading technical publishers in the U.S.A. and have produced here the best collection of structural information relating to steel design that exists in one volume.

The author, Milo S. Kitchum, is Dean of the Engineering College at the University of Illinois, and has here given a standard work of reference for steel designers. Specifications and methods of design, with numerous illustrations are included. Vast tables of standard formulae are given and properties of sections, but unfortunately the latter sections are those of the U.S.A. and differ greatly from the British standard section, but nevertheless the other portions make up the great value of the book.

This edition includes a new chapter on steel chimney stacks and many tables relating to standard dimension columns referred to in an article in our June issue.

The handbook is too well known to require many extracts, but this latest edition is the best of the two editions that have already appeared since 1914.

TENTATIVE AUSTRALIAN STANDARD SPECIFICATION FOR PORTLAND CEMENT.

Published by the Australian Commonwealth Engineering Standards Association. (*Price* 1/-.)

This is the second publication of the Association, whose headquarters are at 16 College Street; the first relating to structural steel appeared some time ago. The specification is a tentative standard only, "being published for a period of twelve months for the purpose of eliciting criticism and suggestions," so a foreword tells us.

Generally speaking the British Standard Specification has been followed, but many alterations have been introduced to meet local conditions. It is pleasing to know we have now in Australia a proposed Standard Specification for cement, for almost 100 per cent of the cement used in the Commonwealth is manufactured within our own territory.

This specification is a little more comprehensive than the British Standard Specification—sections of the Specification deal with samples of testing, the test for fineness, chemical composition, tensile strength of neat cement and cement and sand, test for compressive strength, while the method of determining normal consistency and setting time is also given. Other sections deal with tests for soundness, constancy of volume, expansion.

Two appendices are given:—

A.—Method for estimating insoluble residue in cement.
B.—Method of analysis for estimating the proportions of the several constituents in the cement to be tested

and also a standard form of test certificate stating that the cement was tested according to the methods described in the specification.

In the publication are included plates of the various forms of apparatus for carrying out the various tests. The specification is one of the most important amongst the various standard specifications that the Australian Commonwealth Engineering Standards Association intend to publish, and should be studied by all using this material.

KAHNCRETE ENGINEERING.

(*From Trussed Concrete Steel Co., Sydney*)

In our July issue we reviewed No. 62 of this interesting bi-monthly magazine, now No. 63 is to hand and it contains, as usual, a collection of photos and articles relating to reinforced concrete treatment both in architectural and pure engineering types of structures. An article on "Art and Structural Engineering" contains a few truths about the work of the structural engineer, whom the article says "suitability alone does not suffice; something else is required, if aesthetic excellence is to be attained by the structural engineer"—a very true remark.

Other articles deal with "Colour in Concrete," "The application of reinforced concrete to architecture" and an article reprinted from the "Surveyor" relating to "What is good concrete?"

H. Charlton Bradshaw gives an article, "Architectural Tendencies—English Tradition"; one paragraph brings home to us a fact—a structural fact—that all those devoted to architectural design must have noted ". . . the steel frame, which is now the skeleton of the building, can be made to serve any type of exterior—a freedom which has its pitfalls as well as its advantages."

The periodical is one all can look forward to being sure of a series of interesting reprinted articles.

THE PERSISTENCE OF PREVAILING TYPES

By

MALCOLM S. STANLEY, M.C., A.M.I.E. Aust.

FROM some points of view the influence of a prevailing custom, prevailing thought or existing ideas places a heavy hand over the wheel of progress.

This persistence in practice restrains progress often unfortunately to the prejudice of better things and truer principles. It is a sign of old age. To reject the new may be regarded as a precautionary measure, and new thought, new methods, new aspirations, have ever to thrust aside the opposition accruing from prevailing things.

The influence of contemporary forces somehow shades the real perspective and for considerable periods its shadow hides the truth until by mighty effort, men burst the bonds of prejudice and break into the light. Engineering is full of examples where the persistence of prevailing type has blighted the march of progress. One outstanding evidence occurs with the internal combustion engines. Experiments with these engines preceded those of the steam engine. Owing to the overwhelming success of the steam engine, it was some years before the gas engine again attracted any real attention, and in its revived state it appeared with all kinds of weird steam engine fittings, e.g., eccentrics, slide valves and the like—here we see a decided steam engine influence. The internal combustion engine was a comparative weakling until the engineers of that period cast adrift from steam practices. The influence of the steam engine actually retarded the development of its rival. As a result of the isolation of the internal combustion engine thought, it is to-day the mighty opponent of steam and is gradually ousting it from its accustomed place. In the air it is supreme. Immediately the internal combustion engine was freed from the shackles of prevailing type, it commenced to take its real place and to play its real part in the affairs of men—the wonder is that it survived its bad beginning.

In the world of construction, concrete came in when steel structures were well established. They were the prevailing type and at once we see how these have influenced the progress of concrete. The new material is invested with the lore and tradition of the contemporary schools; surrounded by an environment quite unfitted and uncongenial, concrete struggles on, compelled to play an untruthful part. Concrete has yet to be applied aright and until we isolate it from prevailing influences, we cannot use correctly the mighty material which Science and Engineering have placed at our disposal—we cannot give to it its true form or purpose.

Take the prevailing practice, say, in steel or timber. We divide up a floor area into convenient separate panels, throw in a main girder layout; between these come the secondary beams and over these again we lay our sheeting. That is the usual method with steel and timber; you will note this is precisely the system with concrete—an entirely different material to either steel or timber. We place concrete in the same category as timber and steel and moreover, we are somewhat reluctant to alter the treatment—in spite of the fact that the said treatment may be absolutely inconsistent with the material. It is quite conceivable too that concrete is patient and long suffering under this ill-treatment. Cracks appear in many concrete jobs. How many or how few may be due to the fact that we design concrete along precisely the lines of a steel girder construction? The influence of prevailing types may be stifling the progress of reinforced concrete, and we are content to continue to design along the old lines of stiff concrete girders co-operating with thin slabs.

Twenty years ago an engineer burst through the bonds of tradition, throwing aside the usual characteristic "concrete based on steel type" design. He let in floods of new thought on the true principles of applied concrete and gave to us the "girderless flat slab"—a treatment which is a truthful interpretation of reinforced concrete, and one that is free from the influence of the contemporary schools. This form of construction is still viewed with considerable uneasiness, but the fact remains, that it is far superior and more efficient than the girder type of floor, in economy of material, first cost, and load carrying capacity.

The girderless floor *is the peculiar perquisite* of reinforced concrete, and whilst even now our sense of proportion and stability is somewhat injured by the absence of projecting girders, it is only a matter of adjusting ourselves to the new order.

The concrete girder floor belongs to the era when concrete design was entirely influenced by contemporary types. Its properties were not so well known as they are to-day, and like the steam engine, in which *actual practice preceded its theory,* so the girderless concrete floor as designed and erected is analytically unsound. It is in advance of any generally known mathematical analysis; still, these girderless floors are carrying loads, and giving excellent service.

Prevailing thoughts and customs die hard, new methods meet apparently imponderable opposition. This resistance, however, is a soluble element gradually dissolving in the light of advancing truth, and whilst the persistence of prevailing things may apparently retard progress for a time, he would be a weakling who would remove entirely that human tendency to adhere to the existing order. The very strength of new progress is intimately interwoven with the old and that resistance to change which is based on *balanced thought* is the refining mill through which the ore of all new progress must flow.

INSTITUTE OF ARCHITECTS OF N.S.W.

GENERAL MEETING

MONDAY, 17th AUGUST 1925

SIR CHARLES ROSENTHAL (PRESIDENT) occupied the Chair.

Minutes of Meeting of 7th July, 1925, were confirmed.

Apologies were received from Messrs. Waterhouse, Weston, Adam, Richardson and Manfred.

CHAIRMAN: Before any business is taken I feel that I would like to say a word in connection with the unfortunate death of Mr. Day, our late honorary secretary. To most of us, certainly to the older members, Mr. Day had been personally known for many years; to some of the younger men, possibly not so long, but to any one who has taken any interest in Architecture in this State for the last few years, Mr. Day's name must have been familiar, if for no other reason than for the amount of work he has put into this Institute as honorary secretary, and particularly in conenction with our Annual Exhibition held for many years past. His death, a tragic one in the extreme, reminds us all that whether we are young or old, we never know the day when our turn will come to lay down our work. It seems so hard to understand why a young man in his 37th year should be called upon to lay down his work just when he was grasping it best, and when the indications were so full of promise for the future. We distinctly mourn his loss, not only professionally, but as a personal friend. In my own case, you can just imagine what a shock it was to hear of his death, and one can realise also what an awful shock it must have been to his unfortunate wife, who was with him at the time, and literally saw him taken from her side.

Mr. Day's work was not confined alone to Architecture. He was one who had definite ideals and lived up to them, and thought fit to give of his best to the service of his country in the direction of Local Government. The District of Vaucluse owes him a good deal as an alderman of that Municipality. At the last meeting of the Council, we decided to send a letter of condolence to Mrs. Day, expressing the sorrow we all felt at the loss of her husband, and I felt that members present here this evening would also like to do the same. I shall presently ask you to pass a resolution to that effect, while we are standing. Personally, Mr. Day and myself had eighteen months of the happiest association as partners, but not because of that, but particularly because of Mr. Day's work for the benefit of this Institute, we cannot allow the occasion to pass without recording our sincere appreciation of the work he has done for so long, and our regret that he is taken from us. I move that a letter of condolence be sent to Mrs. Day.

MR. PEDDLE: In seconding the motion, I would like to repeat what I said at the Council. It is very often when we lose friends that we learn how much we have appreciated them; we sometimes do not notice it so much at the time. When I could not get away from the fact that Mr. Day had passed away, I just felt as though I had lost a very dear brother. I am quite sure a great many of the members of the Institute who have been closely associated with Mr. Day will have the same feeling. I feel the loss very very deeply. I cannot say any more.

COLONEL HURST: As one who was very closely associated with Mr. Day in his Local Government work, I can speak very feelingly of his usefulness in that sphere. He was one who stood out amongst many in his work and his honesty of character, in the way he carried out his duties in his Municipal life. His loss is keenly felt by the Municipality of Vaucluse, and not only in that but in other walks of life. I met a man in the tram the other day, who was discussing his loss, and he remarked that Mr. Day was not only useful in his architectural and municipal work, but in sport he was always willing to give his help. He instanced a time when they had a small Rugby Football Club (you know Mr. Day was a keen Rugby football player) and he was always willing to give up his time, and he did regularly attend their meetings to help the men in their training and assist them in every way. He gave his time in things other than his architectural profession, and his loss is keenly felt outside the profession, as well as in.

MR. MUNNINGS: I had not known Mr. Day very long, but one feature of Mr. Day's character stood out above all others to my mind. Taking his work as an architect, socially and otherwise, he struck me as being a man who put Australia before himself, and that is saying a great deal. A man who can forego little petty advantages for the benefit of his country is a man whom it is a tragedy to lose.

MR. HARRIS: Having been associated with Mr. Day on several of our Committees, I think there are very few probably in the Institute who realise quite how much he did for us. He was not one who sought the limelight under any circumstances, but for a great many years past, he has almost singlehanded looked after such things as the Annual Dinner, and to a great extent the Exhibition, and the influence that the Exhibition has had on the public may indirectly to a large extent be credited to Mr. Day. Had it not been for his energy, we should not have been able to put up as good a show as we have done, and many of the functions which did pass off so smoothly were due to his indefatigible work. I am sure that members will realise we have lost one whom we will find it very difficult to replace.

(*Motion carried—members standing.*)

A ballot for new members resulted in Messrs. F. G. Castleden and A. C. Castleden being unanimously elected.

THE CHAIRMAN read a letter from the Secretary of the R.I.B.A. acknowledging receipt of a donation of £30/9/- towards the restoration of St. Paul's Cathedral, London.

COL. HURST read a report from the City Health Officer.

RECONSTRUCTION OF PREMISES TO COMPLY WITH PURE FOOD REGULATIONS.

A note might be made through the Press in order to direct the attention of owners and architects to the need, when contemplating the use of any premises for the sale of food, more especially restaurants and tea-rooms, for communicating with the City Health Officer, so as to secure compliance with the Regulations of the Pure Food Act.

Sometimes unnecessary expense is caused by alterations having to be undertaken to make premises planned for one purpose adaptable to another, which might be avoided in the first instance by consulting the Authorities.

The power to license all such establishments has now been conferred on the City Council, which has at present under review a Draft of Regulations which also have been submitted to the Association of Caterers and Restaurant Keepers.

During the past three years 104 premises have been closed by the City Council as being structurally unsuited. It is intended that after a reasonable period there shall be no restaurant that is not in accord with the spirit and letter of the Pure Food Act and Regulations.

COL. HURST read report from the Board of Architects of N.S.W.

MEETINGS: The Board held six meetings during May, June and July. The Education Committee met once.

REGISTRATIONS—Approved and Declined: Four registrations have been approved, namely, James Hicks, Alfred Henry Norman Sambrook, Vincent Laidley Dowling, Laurance Henry Rudd. One application was declined.

AUSTRALIAN MEDALLION AND TRAVELLING SCHOLAR: The Faculty of Architecture of the University of Sydney nominated Mr. Kenneth Hamlyn McConnel, Bachelor of Architecture, of the University of Sydney, for the Australian Medallion and Travelling Scholarship of the Board. Mr. McConnel was awarded the Bronze Medal at the Final Examination for graduation in 1924. He left Sydney to continue his studies abroad on the 25th July.

The Faculty represented that two other applicants, Kenneth Anslemn Odling, Bach. Architecture, 1923, and Norman Welland McPherson, Bach. Architecture, 1923, were also eminently qualified to benefit themselves and the State by the award of a Travelling Scholarship.

As the Board of Studies of Sydney Technical College was unable to nominate a Diploma Student of the Technical College this year, the Australian Medallion and Travelling Scholarship could not be awarded to a student of that Institution. It is expected that there will be several brilliant students next year, who will qualify for this award.

SPECIAL GRANT: In view of his outstanding merit, though not a Diploma Student, a special grant of £100 was made from a private fund subscribed by some members of the Board to Mr. Meredith S. Smith, a deserving and promising student, whose design was accepted by the International Architects Conference and published in the Book of Proceedings. He proposes to leave Sydney early next year to study abroad.

DESIGN FOR AUSTRALIAN MEDALLION: Competitive designs to be lodged with the Registrar by the 17th October next are being invited for the Ausstralian Medallion. The accepted design or model will carry a premium of twenty guineas.

AMENDMENT OF THE ACT: The Board has determined the particular direction in which amendments of the Act are considered desirable. These have been referred to a Committee for the necessary drafts.

ARCHITECTS FUND—INVESTMENT: The Act restricts the investment of the Funds of the Board to the State. The Treasurer has been asked to allow interest on the major portion of the Archtects Fund in the Special Deposits Account, as a fixed deposit for two years.

PRESCRIBED EXAMINATION: In view of the number of examinations which take place at the end of the year, it has been decided that the next prescribed examination of the Board shall be held during the first fortnight in March, 1926.

ENDOWMENT FUND: Mr. B. J. Waterhouse withdrew his previous offer to donate ten guineas from the firm of Waterhouse & Lake, and decided to give in place thereof the whole of the fees granted to him as a member of the Board, placing his offer on all fours with that of Mr. Godsell and Mr. Budden. The Board expressed its gratitude to him.

R.I.B.A. EXAMINATION: The Board congratulated the Institute of Architects on the receipt of a communication from the Board of Architectural Education, Royal Institute of British Architects, in which it was intimated that the Council had decided to grant recognition for exemption from the R.I.B.A. Intermediate Examination and from the Final Examination, with the exception of that portion relating to professional practice, of the School of Architecture of the University of Sydney, upon certain conditions. The thanks of the Board were also conveyed to the Royal Institute of British Architects for the concession granted.

RECIPROCITY: Negotiations have been initiated with the Victorian Architects Registration Board with a view to ascertaining the terms under which that Board would be prepared to enter into reciprocal arrangements with regard to registrations. It has been suggested to that Board that reciprocity would be facilitated by the elimination of the word "Registered" before the word "Architect" in the Victorian Registration Act.

GENERAL: The Board has had under consideration and taken action with regard to the illegal use of the word "Architect," applications for re-registration, the removal of names from the Register, eligibility for, subjects of, and exemptions from the prescribed examination, questions relating to the conduct, fees and practice of Architects, and the suspension of Roll Fees.

DECEASED ARCHITECTS: The sympathy of the Board has been conveyed to the relatives of the late John Barlow and Harry Cooper Day, the sudden death of the latter resulting from a particularly distressing and painful accident.

MR SCOTT moved—"That the report be received."

MR. HARRIS seconded.

(*Carried.*)

THE CHAIRMAN read a letter from Mr. Manfred, of Goulburn, and presented a prize of books, amounting in value to five guineas, donated by that gentleman, to Mr. R. S. Hawdon, the successful winner.

MR. E. A. SCOTT moved:

> "That it shall be an instruction from this General Meeting to the Council to give serious consideration to the question as to whether the time has not arrived when this Institute should ask the Board of Architects to relieve them of the control of the purely business side of the profession, such as fixing the scale of charges, control of breaches of practice and other such matters."

When giving notice of my intention to move this motion, I purposely put it in the verbiage it is in. My reason for that was that I did not wish to introduce in the first instance my own ideas on the subject. I wanted the Council to consider it themselves, and refer it to the Practice Committee, or do whatever they might think fit, so that the question might be seriously considered before it was embarked upon, because it is not a small matter for the Institute to surrender any of its duties and privileges to another body. I felt, however, that it was very probable that the Council, after considering my recommendation, might consider that the Board was endued with more power under which they might do better work, than the Institute, because they are a Board appointed by the Government. That fact in itself is a source of great strength, inasmuch as the decisions of the Board will naturally carry more weight with the Government and with the public generally. For instance, if the Board determines the scale of fees, it will no doubt become a recognised scale in the Law Courts, and we will not have the absurdity of a barrister holding up a sheet of drawings which a man has taken weeks or months to prepare, before an uneducated jury, and saying, "This is what Mr. So-and-so claims £500 for." The scale will then be a fixed thing just as the scale of charges laid down by the Law Institute and there will not be any debate as to how much is due to the architect for work done. Further, as regards the control of breaches of contract and other such matters, the Institute has, I believe, done good work. I know it has, but at the same time it cannot carry the weight of a body in whose hands rests the bread and butter of architects.

It is just as well, in times such as these, when we are all becoming commercialised, that the control should, to a certain extent, rest in the hands of the people who have the real financial control, as well as the more sentimental control which the Institute of Architects has through the professional instincts of the profession. I do not intend to bring forward any reasons for introducing this motion to-night, because my object is that the Council should first consider it, if you think fit. This suggestion comes from myself. I have asked nobody to second or support me. I ask you whether you do not agree with me that by the step I propose some benefit might not be derived.

When I made the first proposition, I knew that there was a great deal of machinery to go through, which would take some time, so I am moving a second motion, because I think this is a matter of pressing necessity. Our book of scale of charges at the present time is a strange concoction, and has to be altered or re-printed, at once, I think. Therefore, my idea was that the Council should consider whether it is all as it should be. I do not think it is. There are two items I would mention. One is the scale of charges for small work at 6 per cent., and very large plain work at 6 per cent. In my opinion, this is not right. Further, the sketch plans are paid for at the same rate as working drawings. I cannot conceive that both these items are right. Before we print a new book of scale of charges, I would like the Council to consider whether there is not room for improvement on these two subjects.

CHAIRMAN: Mr. Scott's idea of passing this matter on to the Council was to give the Council an opportunity of discussing the question in detail, with a view to reporting to a general meeting at a later date.

PROFESSOR WILKINSON seconded.

Motion Carried.

MR. SCOTT moved:

> "That it be an instruction from this General Meeting to the Council that they will at the earliest moment give consideration to the amendment of the scale of fees to correct the various anomalies contained therein."

MR. SOMERVILLE seconded.

Motion carried.

CHAIRMAN: The following names have been submitted as candidates for election as members of the Institute at the General Meeting in September, 1925: Messrs. John C. Aisbett, 537 George Street, Sydney, and C. Penn Bradley, 123 High Street, Neutral Bay, proposed by Messrs. H. J. Wagstaff and R. M. S. Wells respectively.

THE CHAIRMAN, on behalf of the members of the Institute, extended to Professor Wilkinson their best wishes to him for a pleasant journey to the Old Country and a safe return, to which Professor Wilkinson briefly responded.

CANBERRA—PAST AND PRESENT

By

SIR CHARLES ROSENTHAL

SIR CHARLES ROSENTHAL: It falls to my lot to say something about Canberra—Past, Present, and Future. First of all, I would remind you that we propose arranging a tour to Canberra next month. My object in giving this address is not that I claim to be any great authority, or that what I can give you will be of great interest, but I do feel that the architectural profession is not fully enough aware of the work that has been done, the work that is going on, and the work that still remains to be done. Bearing in mind that a big competition is being launched, particulars of which may be obtained from the Public Works Department, for a new Memorial Building, to cost £250,000, a subject which ought to afford an opportunity for architects to bring forth the very best that is in them, I do feel that it would be a good thing if our architects could visit Canberra on the 18th September, and take the advantage of two days' sojourn in that locality. We do not want to restrict the visitors to architects, but shall be pleased if they would bring their wives and friends. I recently communicated with Mr. Butters, the Chairman of the Commission, and he writes that he is glad to hear that some of our members will visit Canberra, and he will detail some officers to show us around. Mr. Butters is keenly anxious to get as much publicity as he can for Canberra.

In my address, I had hoped to be able to say something about the early history of the work done during the last few years, and to try to visualise something of the future, but when I commenced to collect data for such a paper, I found that one might very well arrange for four lectures rather than one, falling naturally under four heads: First, the history of the Territory and the early settlers; second, the records of the deliberations concerning the selection of the site for the Federal Capital, which covers a number of years; third, the record of the progress made up to date; and fourth, a forecast of the future. It is not possible in the time at my disposal to deal adequately with all four headings, so to-night I will refer briefly to the past history, and confine myself chiefly to what has been done, and what will be done in the future.

I want particularly to acknowledge slides received from the Federal Commission, Sir John Sulman and Mr. Selkirk. If you wish to learn about the early history of Canberra, there are two documents I would recommend, one a paper read before the Royal Australian Historical Society by Mr. H. Selkirk, "The Origin of Canberra," and the other by Dr. F. W. Robinson (who was at Duntroon College, and is now at the Queensland University) entitled "Canberra's first hundred years." It was first visited in 1821 by Charles Throsby. After him came Captain Currie, R.N. They explored a good deal of the country. The first settler who is named as having established himself was the Hon. Robert Campbell, about 1823. The Campbell family retained their interest right up to the time of the resumption by the Federal authorities. There is an interesting history surrounding Ainslee, a trooper who served in the Battle of Waterloo, and, as Mr. Selkirk says, was wounded in the action, and was left for dead with a sabre wound across his head. He eventually recovered and came to Australia, and became more or less a drover and later manager to Mr. Campbell. The first records concerning his work had reference to his taking delivery of 6000 sheep, and he gradually found his way to the Canberra settlement. Another prominent settler was Mr. Joshua John Moore, who had holdings around Campbelltown. He is well known to the Church of England authorities, and materially assisted Church matters in this State. While in occupation of land in the Campbelltown and Camden districts, he made a request for another grant. Eventually in 1826 he asked for land at "Canberry." That appears to be the first known spelling of the name. Mr. Selkirk makes it plain that in the pronounciation of the name, the emphasis should be laid on the first syllable, *Can*berra. The Church bore a prominent part in the development of Canberra. The appointment of the Rev. Edward Smith was in 1838. He was licensed by Bishop Broughton as successor to the Rev. Robert Cartwright, and told to reside in or near Queanbeyan. The foundation stone of the Church was laid in 1841, and shows signs of having been added to.

You may remember the controversy that surrounded our various political leaders and the people of the Commonwealth as to just where that site should be. One can see what has been the result of having the temporary Federal Capital in one of the State Capitals —wire pulling, lobbying and so on. I am sure we will all welcome the day when the Federal Parliament will at last sit in Canberra, and when the door will be officially open to that City of the Future.

Regarding the selection of the Federal Capital site, a Royal Commission in 1899 recommended the Monaro; another Royal Commission in 1903 recommended Albury; the House of Representatives decided on Tumut; the Federal Parliament in 1908 had a proposal put up to them for Dalgetty. They turned down Dalgetty, and accepted Canberra. Sir Austin Chapman, the member for Eden-Monaro, thinks that the right site has been chosen, and he deserves a full measure of thanks for his persistent advocacy of Canberra. Those men who were in control in the past were men of the requisite training and vision, and they selected wisely and well. We think of those great statesmen who are past and gone—Sir George Reid, Sir Edmund Barton, Sir Alfred Deakin, Sir John Forrest of Western Australia—men who were giants in their day, and who did have vision. Our Federal Constitution is one of the finest the world has ever produced. When we think of the development of Canberra, we should not pass by the memory of those great men, who helped to mould our Federal Constitution, and pave the way for the Federal Capital, which is so soon to be an accomplished fact. The early history of Canberra is intensely interesting, and I think all our young students ought to look through those two books I have mentioned, because there they will get in a concise and abridged form a record of those early years, which will help them to realise something of the spirit that lies around that centre. The old pioneering spirit is certainly equally necessary today for those who are helping to build up that Capital City.

I do not in any way criticise the members of the present Board at Canberra. Mr. Butters has done splendid work; Sir John Harrison is a well known and respected master builder, and Mr. Gorman is a man occupying a high position in the Real Estate world. It does seem to me, however, something of an anomaly that, considering the bulk of the work to be done is Architectural, there should be no architect on the Board. Without wishing the present members any harm, we do think (and the Federal Council reiterated this at their recent conference) that, should there be any vacancy, or should it be deemed advisable to add to the Board, an architect should certainly be chosen.

In regard to the buildings at Canberra, while they are fairly substantial they are practically all built of one material—brick. It is an excellent brick, but unfortunately, has so far been kept to one color—terra cotta, with no variations. The recently returned Federal Minister for Works and Railways, Mr. Stewart, promised that something would be done in the direction of securing a variation of colour, but the only type of building one sees at present is the red brick, or the red brick rough casted. Stone and granite are so terribly expensive that I am afraid brick will be the main walling medium for a long time as far as our public buildings are concerned. In Canberra they have already laid down all the great services, such as water supply, sewerage, electric light. This will make things easier for future development. One of the big problems of the authorities has been to insure adequate development on reasonably moderate cost lines.

Institutes of Architects all over Australia rather fought against the idea of having a temporary building for Parliament House. Among public men there were two schools of thought. One side said, "We must get buildings erected quickly." The other side, mainly consisting of architects, said, "We think the right thing is to prepare complete designs for permanent buildings, and build such part as is required for the present." I suppose that the temporary building will remain as long as any of us are practising architects. The contractors who have had to handle Canberra work have had no easy job. They have been surrounded by difficulties in regard to labor.

One is glad to see the activities of the Commonwealth authorities in regard to forestry. If there is anything we, as architects, ought to take interest in—it is forestry. The Government has established a school at Canberra, and is now securing accredited students from each State with a view to giving them a sound training and sending them to Oxford to finish their course there, and see something of the forests of Europe. We must remember that we are in a different position here to the old country, where many estates are entailed, and where an owner realises if he plants to-day, his descendants will reap the benefit later on In Australia the only two bodies who could be expected to look to the future are the various Governments and the big mining concerns, who may have coal fields with hundreds of years supply of coal, and who are liable to be faced in the future by a shortage of timber for pit props and other purposes in the working of the mines. I hope to see a co-ordinate system between the Commonwealth and each State, whereby each State will only grow those trees which best suit soil and climate, and will come to early maturity.

Major-General Sir John Bridge's grave is at Canberra. He laid down the first principles of Duntroon. He commanded the 1st Division, A.I.F., and was wounded at Gallipoli. He died on board ship being sent to Alexandria, where he was temporarily buried. His body was afterwards brought to Australia, a service was held in St. Paul's Cathedral, Melbourne, and he was later buried with fitting military honors at Duntroon.

Sir John Sulman's knighthood came to him as the result of the work he did at Canberra. Many d not quite agree with what he has done, including some who are in authority at present, but I think it is only fair that we should remember with gratitude what he has done, much of it in an honorary capacity.

A letter from Mr. Moore to the Colonial Secretary in 1826 is the first recorded instance of Canberra being mentioned. You will notice it is spelt "Canbery." There has been some difficulty in getting the real meaning of the word.

What some say to be the third oldest stone in the Church yard of St. John's is that of Sarah Webb. It is interesting and prophetic to note the inscription "Here have we no continuing city, but seek one to come."

I am indebted to Professor Wilkinson for a slide showing Canberra, Washington, the Champ-Elysees, and Sydney Harbour to the same scale.

I feel that whoever may be on this planet 100 or 200 years hence will have cause to look back with a great deal of satisfaction to the foresight and wisdom of those who in the first place selected the Canberra area as our Federal Capital site, and secondly, for the system they adopted in its development. Obviously, we are all governed by our limitations, and that applies to Governments as well as individuals, but I think we will agree that the best efforts have been put forward in the way of getting a thoroughly well designed city. It remains to be seen now whether the architects of Australia can cover that site with buildings worthy of our Commonwealth and profession. The work of our Federal Council has brought about this result, that the later Commonwealth authorities have recognised the architects of Australia, and are throwing open public buildings for competition. If it had not been for the agitation of the Council, the Public Works Department might have designed all public buildings. The future lies in the hands of the architects. There will be competition after competition, and I say it is imperative that the students of to-day, as well as practising architects, should learn something of the history of Canberra, and watch its development closely, because only by doing so can they get the spirit of Canberra into their blood, and translate that spirit into design. If I have succeeded to-night in interesting you in Canberra to the extent of causing you to go there and learn something for yourself, the object of this evening's address will have been achieved.

MR. SELKIRK: I would like to make a slight correction of one statement made by Sir Charles. You referred to J. J. Moore as having done a great deal for the Church in Australia. It was quite another Moore who did so much for the Church. There is an element of doubt as to whether Moore or Campbell got to Canberra first, but the difference of period is so slight as to be not worth arguing about. Their respective stockmen must have arrived almost at the same time from a certain chain of reasoning. Moore played no figure in Canberra—Campbell was everything. But for him there would have been no Church. That Church served the needs of all denominations.

I do hope that Church will always be treasured, because Canberra grew up round the Church, Campbell himself being a great Churchman, and also the father of the settlement in every way. That Church should be very jealously guarded as a national monument. I collaborated with Dr. Robinson, and we combined our information. He wrote a domestic history, while I wrote of what I call the origin.

PROFESSOR WILKINSON: I have much pleasure in proposing a vote of thanks to Sir Charles Rosenthal for his interesting talk on Canberra up to date. I was fortunate enough to spend a month there in January of 1914. What must strike most of us is the excellent draftsmanship of those 8 scale drawings. I think the Church and the vicarage ought to be for ever safeguarded. I also think the route of the Railway line ought to be re-considered, and moved closer in towards the base of Mt. Ainslee. Wherever the station is, people will have to have motors and bicycles, and I do not think the railway should come too close in to the City. I also think a note of warning ought to be sounded. It is fine to have big ideals, but I am not at all sure that the dimensions have not been a little overdone. These immense distances should be really grasped before the work is allowed to go too far.

MR. MUNNINGS seconded the vote of thanks, and was supported by Mrs. Taylor, and Mr. Nelson. Carried by acclamation.

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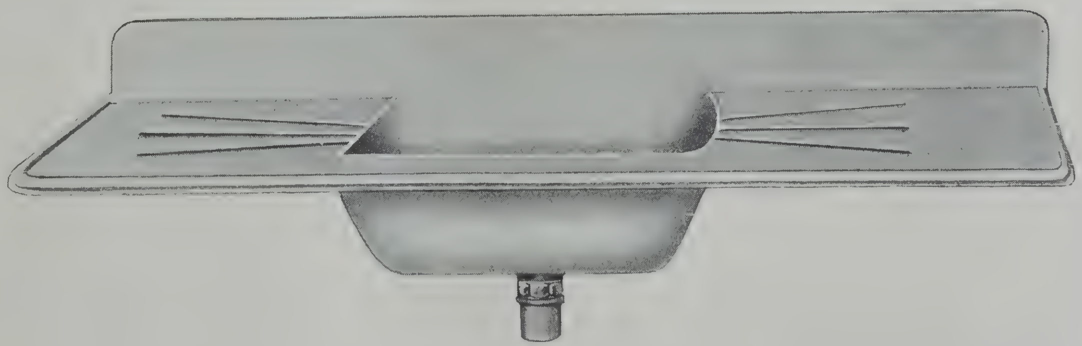

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NEW SAFETY SCAFFOLD

AN INTERESTING DEMONSTRATION

A VERY interesting demonstration of the use of a patent Safety Scaffold was given recently at premises in course of erection at the corner of Druitt and Kent Streets, in the presence of about 100 Sydney Master Builders.

The Trussed Concrete Steel Coy. (Aus.) Ltd., of York and Wynyard Streets, Sydney, as Agents for the American Patent Scaffold Coy. of New York, U.S.A., were enabled through the courtesy of Messrs. Wm. Hughes & Coy., the contractors for the building mentioned, to demonstrate to an enthusiastic and keenly interested audience the working of a Suspended Swinging and Safety Scaffold device which is claimed to be economical, convenient, easy to operate and perfectly safe.

Captain Wilbur Johnstone, the Field Representative of the American Patent Scaffold Coy., who recently arrived from Japan and the East, was in charge of the machines and the ease with which he manipulated the device provided conclusive proof of its simplicity of operation and absolute safety.

Although comparatively new to Australia, these machines are now almost universally used throughout the United States, Canada, North and South America and are also well established in England and Japan. The Master Builders present at the demonstration were much impressed by the device and judging by their expressed opinions the Agents can anticipate a very busy time supplying these machines to many of the buildings now in course of construction in Sydney and suburbs.

This new type of Scaffold certainly presents a sound proposition and should go far in revolutionizing the more or less antiquated methods of scaffolding in use in this country to-day. It is trim and neat, safe, easily erected, simply operated, practically foolproof and eliminates all the inconvenience and trouble that characterizes the old system of poles, putlogs, bearers, etc. This new safety scaffold consists of a number of units composed of an outrigger, rolled steel joist, secured to top of building and projects some six feet at right angles to wall. From this beam is hung an inner and outer steel cable suspended from a shackle carried on R.J.S. At lower end the cable is attached to two drums or winches which are worked on a ratchet principle; fixed to the bottom of the steel frame which supports the drums, there are two angle irons bolted together which form a putlog to carry floor planks of scaffold. By a backward and forward movement of pipe handle, attached to ratchet on drum, the scaffold is raised or lowered at will. The whole of the machines used in the demonstration were made in Australia by the Sydney Machine Company of Waterloo, N.S.W. Some three hundred more of the machines are now in course of construction for the use of builders throughout Australia.

RAPID BUILDING CONSTRUCTION.

An inspection of the new building, which is being erected in reinforced concrete for Messrs. Spicers & Detmold Ltd., to the plans of Messrs. Ross & Rowe, Architects, elicited the information that the frame work of the building has been constructed in record time, occupying 65 working days from basement to the roof cornice. This is an achievement that reflects considerable credit on the organization and supervision of Messrs. Wm. Hughes & Coy.

The display and tour of inspection, which occupied the attention of builders and others for about an hour and a half, was apparently much appreciated by those present. The afternoon was terminated by an adjournment to the ground floor of the new building, where light refreshments were served.

LIGHT THROUGH THE AGES

THE Evolution of the Lamp is the subject treated in an attractive booklet we have just received from the Vacuum Oil Company Pty Ltd. In this is briefly traced the progress of household illumination from the time of the earliest known lamp—that is, about 3000 B.C.—to the present day.

Concurrently with the development of the lamp, the fuel used has undergone many changes. The evil-smelling, smoky oil of Babylonian times has given place to the clear, clean fuel that can be secured to-day. Science has been applying itself earnestly to the development of illuminants. It has worked along many lines but, so far, nothing has been developed which gives light which is more pleasing to the eyes than a lamp filled with the highest quality kerosene. Laurel Kerosene—"the soft, white light"—represents a great achievement in the world of science. It is the product of long experience and expert skill in refining applied to crude oils most suitable for the manufacture of kerosene.

Supplies of this booklet may be had upon request to the nearest branch of the Vacuum Oil Company Pty. Ltd.

ARCHITECTURE

THE JOURNAL OF PROCEEDINGS OF THE INSTITUTE OF ARCHITECTS OF NEW SOUTH WALES

Vol. 14. No. 10.
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October, 1925

WHAT IS AN ARCHITECT?

WE know what he was before the late war: an idealist, an individual whose mission was to make over the world in what he considered the most beautiful guise, a man entrusted with large opportunities coming in often faster than he could muster them and striving his best to keep up with the tremendous increase in the requirements and the possibilities of modern construction, a dreamer and strictly a professional man. It was a splendid ideal and all honour to those who strove so nobly to uphold this exalted plane, but that the architect of after the late war is a different man is evidenced on every hand. The point of view is changed not only because of war but because it was in process of changing before. The profession as a whole set its face against change and looked frowningly upon those who from limited equipment or limited choice did not measure up the individualistic, imaginative standard of 1876 and later, and now the question is a very pertinent one, and should be scrutinized very closely by all who desire to be in the tide of progress, for progress is the only thing that keeps any profession or calling alive. It is the stirring of the water by the invisible hand which brings healing, growth and prosperity.

A statement has been made that an architect is first of all a business man; second, a constructor, and, third, a dreamer of dreams, or otherwise a designer. There have been those who assumed that because of this triple nature all that was necessary for an organisation was for some clever business man with brains and power of organization to get around him some bright, young men, divide up the work according to their several abilities, and presto we have an architectural organization. Nothing could be further from the truth than this. An Architect must be a business man, but a business man by merely wishing cannot make himself an architect. An architect may and should develop into a business man if only by association, but if we can read at all aright the actual results, a business man, unless he has the architectural instinct as a foundation can never develop himself into an architect, even by association. Again, we have seen in the past repeated attempts to develop a building organization based only upon engineering experience. Strictly speaking, the engineer's structure may be mechanically perfect, but it is apt to be a mere aggregation of units each possibly perfect of itself, but not co-ordinated in a logical, symmetrical whole, thereby failing to be the record of progress and history which is an appange of architecture. The engineer merely points the moral. The architect should both point the moral and adorn the tale. A structure such as the Brooklyn Bridge, which starts out to be merely an engineering work, may prove to be pure architecture, for the simple reason that it becomes what all good architecture is, orderly creation and arrangement for a distinct purpose and need. And on the other hand, architects have made some extremely successful factories which, while governed by simple engineering requirements, were yet creations. But it has been demonstrated again and again that the start must be from the architectural standpoint. Some years ago a prominent firm of contractors in New York set out, as they themselves expressed it, to eliminate the architect by doing themselves everything that an architect would do, hiring draughtsmen, attending personally to the construction, and thinking thereby to leave out a certain amount of friction which seemed to them inevitable, and which impeded the most economical results, but as a matter of fact, I believe that same firm admits to-day that the attempt was a failure, and that the architect could not be eliminated without at the same time eliminating the architecture. Again, an attempt was made by a very prominent brokerage firm to eliminate the architect by carrying out in the name of the builder all the portions necessary to a finished structure, hiring such architects as they saw fit to carry out their wishes, but retaining the real direction, financial, artistic, and otherwise, in their own hands. This organization has done some very creditable work, but it has not been architecture in the sense in which we mean it, as being in any way representative of the aspirations of the people, and the clearly defined and simply worked out practical needs. It may be said as a general proposition that the architect is more apt to know when to use the engineer or the business man than either of them knows when he needs an architect. Furthermore, there have been some most lamentable examples of failure directly traceable to the fact that architecture was considered merely as an adornment and not something vital, or that the only vital factors were the engineering and the business ones. A Court of Honor in a large school group which is so arranged as to disrupt the interrelation of the parts is a hopeless failure. To enter a building expressed as a dome on the exterior with an imposing portico before it and then to find oneself in a mechanical laboratory, and discover that the dome is a mere useless appanage is surely not an ideal combination of architectural possibilities and engineering or practical demands.

How then do we find that an architect is temperamentally constituted in these days? Of course, we have not changed wholly yet. The old regime still endures and there are always to be those who cling to the individualistic ideal of which Ruskin was so strong a champion, and which really made possible the condition of the profession to-day, but if we try to take a dispassionate measure of the architects of to-day who seem to be doing the best work, and at the same time the most successful in every respect, we find a basis in every case of architectural appreciation, education, and development.

We find that the most successful architects to-day in this country have primarily had the creative faculty, and as far as can be determined by a pretty wide acquaintance in the ranks of the profession, there is not a single architect to-day, who does not owe most of his success to the fact that he is businesslike and knows how to construct. On the other hand, it is equally true that there is not a successful architect in the United States who owes his success only to the fact that he is an artist. We find, too, that organization has counted in the past as a very important factor in the successes, and that as a general proposition, the architects who are awake to the possibilities of this day, and are reaching out to larger fields, to broader horizons, and to more perfect success, are those who have been able most effectively to balance the three sides of the profession, not letting any one assume any more than its due relative importance, but viewing them all from the architectural standpoint.

The case of one architectural firm comes to mind as typical of the new tendency in our profession. This firm occupies an entire building with its offices. On the ground floor is a bank which is so directly connected with the work of the architectural firm that though in name they are distinct, in fact the resources of one are ever ready to back up the recommendations and the judgment of the other. In the second floor on one side is an art gallery, where the architectural organization can exhibit its own ideas, and where also it gathers pictures, furniture, tapestries, or works of art which it can reasonably recommend to its clients for certain specific cases. On the other side are the reception rooms of the firm, where the clients receive their attention, and are encouraged to formulate and present their desires. There is a thoroughly equipped department of accounting, another equally well equipped of inspection and engineering, a large and carefully selected library, and finally, the center of the whole organization, the designing department. This firm has done most excellent work, and its work has been recognized by the profession, and by the public as being of a very high order, and yet a comparatively short time ago, its organization would have been looked at askance by the profession and its attitude towards financing and construction would have been condemned, yet this firm constitutes one of the most successful units in the country.

Again, there comes to mind another organization headed by a single architect, who, in his early days, made a distinction for himself as a draughtsman and designer and an artist. His association represents as complete a business and professional equipment as one could wish, with every facility and every convenience and every accessory which would contribute in any degree to making the buildings he undertakes answer fully their best and highest purpose. It goes without saying that everyone would not solve the problems as he or his organization would, but the average of the work turned out by this office is so high, and its buildings are so eminently successful, that it would be denying the facts to assert that this does not represent the successful architectural effort of the day, even though five years ago his professional standing was not in favor with many of the conservative architects.

All architects cannot be great, but the essence of greatness is in all good architecture, and it is this element of imaginative conception wrought out into an efficient, well-rounded development that constitutes the best and most hopeful phase of the architecture of to-day.

The question may well be asked, is it any better than we had before? Some think it is and others while recognizing the efficiency of the modern view-point, deny that its result can satisfy or ever produce work equal to the great periods of the past. But surely the present viewpoint is more attractive to the beginner in that it offers a distinct career leading to the highest results. The awards certainly are larger, for no architect can make more than a bare living if he depends upon his own effort; and measured by the highest standards of real service to the community, the modern architect is what the old regime never produced, a factor in civilization, an important element of modern life and a historian of the nation's progress. Architecture has been defined as a mood made permanent. There are many moods in the multitudinous currents, of the busy life of to-day, so different in all its eddies and turns, from the quiet, contemplative life of the past, and we make those moods permanent by clothing them in tangible, available envelopes, and by fixing them in terms which mean permanence and efficiency. Surely this comes pretty near being good architecture. And, given a professional point of view, such as has been intimated in this paper, there seems to be no end to the possibilities of the profession. Great achievements in large undertakings, and great successes in the small, intimate work are now equally within our reach. The moulding of public opinion through the mirror which we hold up to it is now our task, and will be the rule rather than the exception. Architects are not a privileged class, only a small coterie of mutual admirers who can now be, if they wish, the leaders, the inspirers, the promoters, as well as the constructors and the idealists. Surely this is a programme well worth following out and building upon, and whatever we may think of it, whether we agree it is right or wrong, whether we sigh for the old days, we cannot get away from the actual facts that architecture and the architect to-day carry out the programme which has been outlined, and that the successful architect is the man who has the widest grasp upon the many sided demands of his profession.

And with it all there still remains the ideals, but they are not lowered or cheapened by the associations with business and science. Rather they are made higher and more inspiring, and, as never before, the profession with its many sidedness can take to itself the words of John Ruskin, who wrote for an imaginative period when it was the rule to think and act in hyperboles and when common sense and hard, practical requirements were brushed aside as derogatory to a professional man, but words which are just as applicable to-day to the kind of work which, with all its opportunities and limitations, its hope and its necessities, can now be realized by the profession;—

> "When we build, let us think that we build for-ever. Let it not be for present delight nor for present use alone. Let it be such work as our descendents will thank us for, and let us think, as we lay stone on stone, that a time is to come when those stones will be held sacred because our hands have touched them, and that men will say as they look upon the labor and wrought substance of them, 'See! This our Fathers did for us.'"

(Reprinted from "The American Architect.")

INSTITUTE OF ARCHITECTS OF NEW SOUTH WALES

ORDINARY GENERAL MEETING

TUESDAY, SEPTEMBER 1st

MR. HOOK (Vice-President) occupied the Chair.

The Minutes of last Meeting were confirmed, on the motion of Mr. Scott.

Apologies were received from the President (Sir Charles Rosenthal), who was absent at an important military gathering, Messrs. A. Somerville, L. McCredie and A. W. Anderson.

A ballot for new members was taken. Messrs. Dobson and Richardson were appointed scrutineers. The result of the ballot was that Messrs. John C. Aisbett and G. Penn Bradly were unanimously elected members.

THE CHAIRMAN reminded members of the forthcoming trip to Canberra on the 18th September.

THE CHAIRMAN said that he had much pleasure in introducing to members present Mr. W. W. Froggatt, who was to give a lecture on "Timber Borers, Beetles and White Ants." He regretted that there was such a small attendance to listen to what he was sure would be an extremely interesting lecture, but he thought the bitterly cold night had a good deal to do with it. If the room was adequately warmed, he was sure there would have been a larger gathering.

(Lecture, illustrated with lantern slides.)

TIMBER BORING BEETLES AND WHITE ANTS.

(Walter W. Froggatt.)

Mr. Froggatt divided his address into two sections. The first dealt with the timber boring beetles which infest the logs and timber after the trees were felled, and before and after they are turned into commercial timber for furniture and constructional work.

He described the distinctive groups of beetles which are attracted to the freshly felled logs before they are cut up in the sawmill.

Those that enter the wood while it is in the course of seasoning, and the others which destroy the dry seasoned timber after it becomes furniture, packing cases, or has been used in buildings.

He claimed that the Australian timbers were becoming so valuable that it would pay handsomely for the timber-getters and saw-millers to protect the felled logs in the forest (when unable to move them at once) with a repellant mixture of oil and creosote against borers. This has been tried in the Islands, and all the logs thus treated reaching Sydney were remarkably free from pin hole and shot hole damage.

The sapwood of our hardwood timbers is very much subject to infestation by Powder Post Beetles, and suggestions were made that the undressed sawn timber could be treated as it came from the saw-bench or while in the stack partially seasoned and rendered immune to their attack.

The question regarding the damage to existing buildings in which New Zealand White Pine was used for flooring or linings was pointed out. The Anobium beetles were particularly fond of this timber, and it was always liable to outside infestation years after it had been used in buildings.

White Ants and Timber.—A general account of the White Ants (Thermites), their life history and method of attack, and means of preventing or checking their infestation was given.

This was illustrated with a series of lantern slides showing the different castes of each species living in a termitarium, the external and internal construction, and the different kinds of white ant nests found in Australia.

THE CHAIRMAN said that he was sure they had all listened with much pleasure to Mr. Froggatt's interesting address. It was somewhat different from the usual subjects that were dealt with at their meetings. He also expressed his pleasure at seeing a number of visitors present who were not members of the Institute. If they would like to ask any questions or comment on Mr. Froggatt's lecture, he would be very pleased if they would do so.

MR. SCOTT: Mr. Chairman and Gentlemen,—It gives me much pleasure to move a vote of thanks to Mr. Froggatt for his interesting lecture to us on two very irritating subjects. I had the honor to be on the committee appointed by the

Government some time since to consider the borer question, and it seemed to me an almost impossible problem to solve, how to get rid of them and keep our wood and timber within commercial bounds.

If architects and furniture builders could only be persuaded to spread their appreciation of the various timbers more widely, it would be very good for the community at large, and for the good of our forests, the same as was done in Western Australia. Nothing seemed to suit them but jarrah at one time, but now they have learned to use that excellent wood, kauri, which serves the same purpose, I believe, some process being used which, I believe, renders it fly-proof. I am sure the Institute is very beholden to Mr. Froggatt for his lecture, and I regret very much that Sir Charles Rosenthal was unable to be present.

MR. NORMAN WEEKES seconded the motion, which was carried unanimously.

COL. HURST said that he had heard it stated that white ants could only work from the ground upwards, and that if their track is broken they must renew it from the lower part. He asked Mr. Froggatt if it was correct that white ants could nest in a building or must come up from the ground.

MR. FROGGATT replied that they could nest in a building if there was any moisture there. One might break the nest, and there might be a colony in the roof, and they could remain there for a long time, but, of course, they would eventually die out.

A VISITOR said that he had heard that in America the timbers were treated with creosote oil, the oil being pumped in. He inquired whether it would not be profitable to do something like that.

MR. FROGGATT said that it would have to be forced in by pressure. The penetrative power of the oil was only one-sixteenth of an inch, and the question was one of expense. Sleepers were boiled in a solution of sugar and arsenic, which, it is claimed, makes these timbers immune. By this means inferior and softer wood may be used as sleepers, the whole structure of the wood being changed. Ants cut the wood with their powerful jaws, just like a chisel; they can almost cut glass, or at any rate frost it. This could be seen by enclosing the ants in a glass case; they use a certain acid on the glass. They could also cut easily through lead and tin. In the tropics tins of jam were often attacked by the ants, causing them to rust.

MR. J. J. RICHARDSON (Public Works Department) said he had listened with great interest to the lecture, and he complimented Mr. Froggatt on the beautiful and instructive series of slides he had shown. It was to be expected that this, being a meeting of the Institute of Architects, Mr. Froggatt would prepare a lecture of special interest to architects. His interest in the subject was more from an engineering point of view, and the problem with which his Department was concerned at the present time was the construction of about 200 miles of transmission lines. Those lines involved the use of about 2,000 timber poles, and what they were very much concerned about was how to treat those poles to avoid destruction by white ants. For the past 15 years they had been putting up transmission lines in this State, and in some cases they had been very successful. Many of the poles were actually standing now after 15 years of service, but, in some cases, the poles had been attacked after having been erected a very short time, and their lives had not exceeded four or five years.

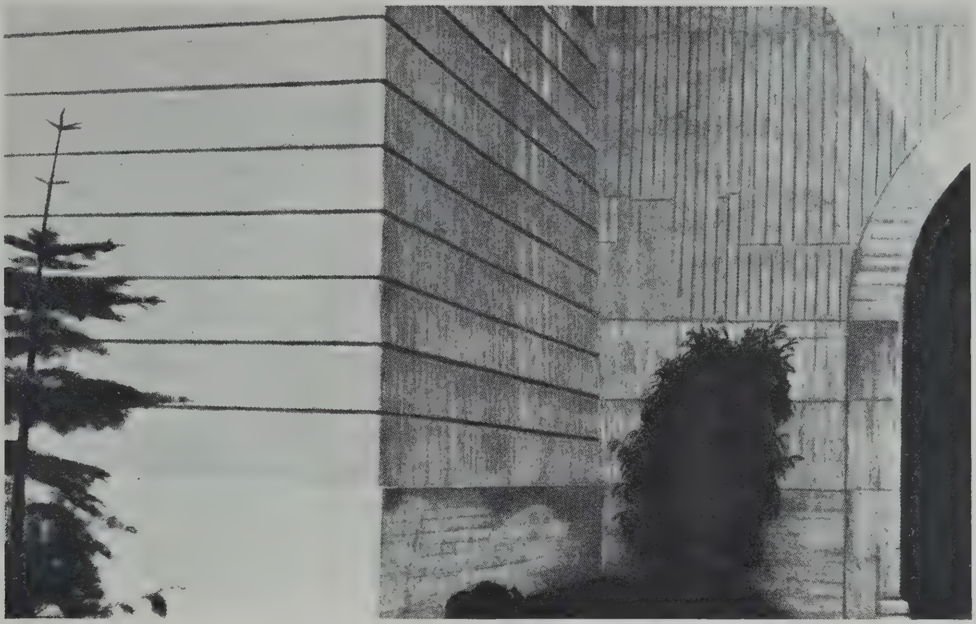
Those poles formed parts of transmission lines extending for many miles. These poles erected represented a value of £15 each, and as they were about to erect 2,000 poles, that meant an expenditure of £30,000 for 200 miles. They had decided to treat them with a special solution at the ground level, but he would very much appreciate it if Mr. Froggatt could give him any special advice. It would mean an enormous saving if they could keep the white ants out of their poles. He thanked the Chairman for the privilege of being present. They used four classes of timber, preferably iron bark, but they also accepted white mahogany, a little stringy bark, and, he thought, blue gum. They had never tried cyprus pine. The objection to that was that it was not as strong as iron bark. With hard woods they used average spans of 650 feet, but with cyprus pine possibly they would have to come down to 350 ft., which would almost double the number of poles required, as well as the insulators. The problem was to find the right solution. It was impossible to impregnate the poles on account of the cost; therefore, they had to coat the outside of the poles with a certain solution. They had for a number of years tried a solution costing about 6/- a gallon, which meant an average of £1 per pole. Recently they had tried another mixture costing about 4/- per gallon.

MR. FROGGATT recommended the use of cyprus pine, and thought that if the poles were treated at the ground level, it should be effective. In reply to Mrs. Taylor, the lecturer said that the by-product from the Gas Company which he had mentioned was simply known as wax oil—wax creosote really.

MR. FROGGATT mentioned that the beetles and white ants had their work to do in the world. Under normal conditions they were very useful, because they reduced the old wood down to a state of earth again. It was only because they had been interfered with that they had become a pest. They were like weeds, which were simply plants out of place. The ants took the place of earth worms, and reduced every bit of dead wood to earth again. They had an important place in nature to play, and probably the timber borers had the same.

The first peal of Bells cast and tuned in New South Wales was recently manufactured by John Danks & Son Pty. Ltd., in their Sydney Foundry. It was to the order of the Rev. J. C. Hawes, Mullewa, W. Australia, as a chime for his Church. The peal consists of five Bells. The diameters of the Bells are respectively in inches, twenty, eighteen, sixteen, fourteen, and twelve, and the bells are tuned to the following notes: C, D, E, F, G. Bell enthusiasts who heard the Bells were very pleased with their fine tones, and with the fact that such skilful work was turned out in Sydney.

ENGINEERING SECTION CONDUCTED BY "BUTTRESS"



A Concrete Building, British Empire Exhibition, showing rusticated and fluted surface treatment.

THE ARCHITECTURAL EXPRESSION OF A STRUCTURAL MATERIAL

By N. WARREN-WATERHOUSE, B.E., A.M.I., STRUCT. E.

THE Age of Steel and Concrete—thus do we speak of this present age, when summing up the modern forms of construction that are now adopted in all countries of the civilised world.

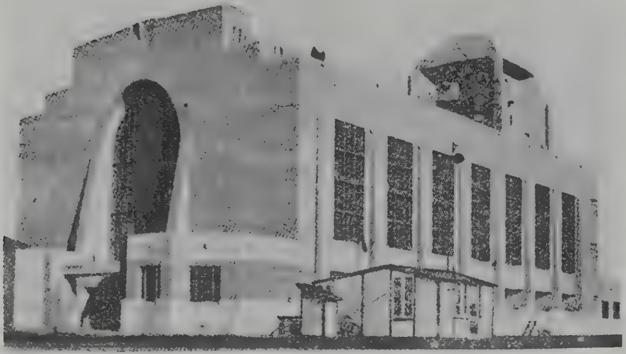
It is these two structural materials—steel and concrete—that form the rigid framework upon which is often formed an architectural masterpiece, known as a masterpiece for the aesthetic treatment of some building material other than that of which its skeleton is composed.

This covering to the skeleton of steel or concrete may be shown as analagous to the muscle and sinew covering of the bones of the human frame. Thus the frame forming the skeleton is entirely concealed, whether it be in steel or concrete. One does admit that in the case of steel it must be covered for protection and act as the framing only, but with concrete why should it be so? Concrete can, in addition to forming the skeleton, serve the purpose of both muscle and tendon, for its properties are such as to make it suitable for both frame and form.

Concrete is usually looked upon as a structural material—and its architectural expression is entirely ignored. The reason for this appears to be due to one main outstanding fact—lack of tradition.

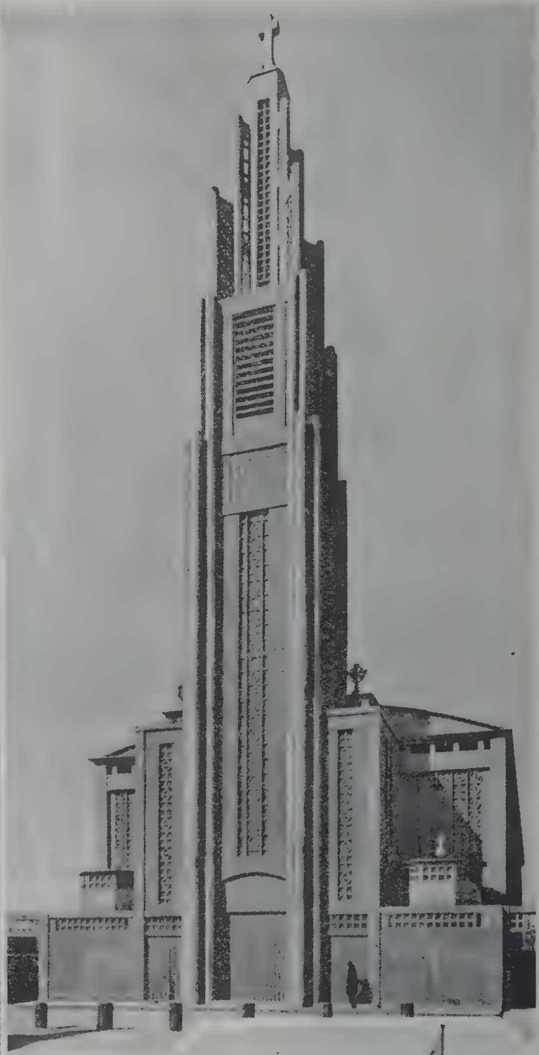
The concrete forming the framing, sprang into being as a structural material, and has remained as such. Its ally—steel—as a material capable of expression, has been used by Engineers in open structures, such as towers and bridges, for years past, and these forms appear suitable for its expression.

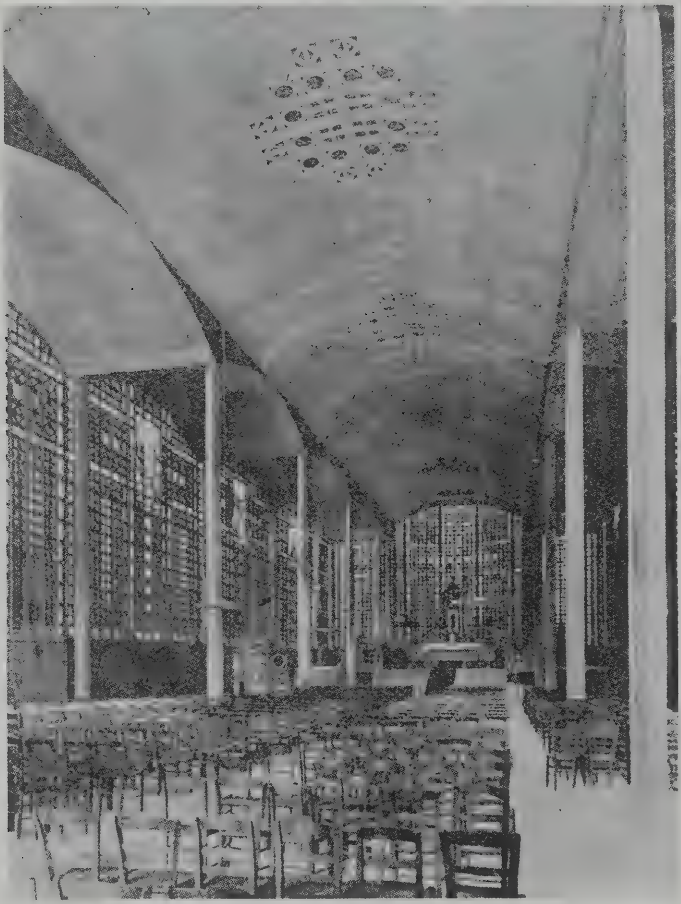
In the case of concrete, as used in building operations, full advantage of its splendid properties for aesthetic treatment have yet to be appreciated. At present very little sense of pleasure is experienced by the public in beholding the few modern concrete buildings expressing concrete, that have been erected in Europe and the United States. But if the impressiveness of scale, the qualities of simplicity and the expression of purpose are appreciated, the sense of beauty will follow later, when we have realised there is a Concrete Style.



A Concrete Wireless Station on the Dutch Coast.

(right) Church of Notre Dame du Raincy, near Paris.





Interior of Church of Notre Dame du Raincy.

The Stadium, British Empire Exhibition.

Surface treatment seems to be the solution of the problem, not as a veneer consisting of facing one constructional material with another, but as a treatment carried out with the actual material forming the whole constructional frame.

Concrete as it comes from the forms is an uninteresting, if not positively ugly material, both in colour and texture, but this fact should inspire the architect to discover for this material pleasing surface textures and appropriate and expressive forms peculiar to it alone. The real distinguishing difference between stone, which usually forms the facing material to a structure, and concrete, another form of masonry, is that one is laid stone by stone and other is poured layer by layer. It is this plastic property of concrete that makes it lend itself to an aesthetic treatment of expressing purpose and structural truth. One must realise that the use of steel and concrete not only alter the external appearance of a building, but also the fundamental proportions upon which the design is based.

The proportions of modern buildings composed of these new structural materials, do not fall into line with those of the early stone and brick masonry buildings, which have given to us the appreciation of various proportions as we know them to-day.

The materials of steel and concrete can be made to serve any type of exterior, and this freedom has its advantages, which bring with it what may be called pitfalls in proportions, but are they always pitfalls? One sometimes feels that there is this attitude because we have not yet got that "concrete sense," when we shall think of concrete in concrete.

In the early Roman Buildings of mass concrete, the proportions of parts of their buildings approximated to the proportions of stone masonry structures, for they had little knowledge of the principles of reinforcing their concrete to reduce the bulk and take certain stresses. As a result, piers were of massive proportions, vaults were of such a thickness as to reduce thrust; and parts generally were heavier than would be the case to-day. It is these types of heavy construction that have given us our sense of proportion, thus proportion with concrete appears to be looked on with suspicion and distrust, and not until this is overcome shall we appreciate fully the principles and facts of this material, that can give structural stability and aesthetic form with new proportions. Early builders appear to have seized upon new forms applicable to various materials that have been discovered, but we do appear to be slow to find a new form of expression for this modern material, concrete.

Concrete will never express anything more to us than a structural material unless we can find the best architectural form for its expression. It is at this stage that the Structural Engineer and the Architect can seek each other's counsel, and it will be the Architecture of Concrete that will bring the Engineer and Architect more closely together—a co-operation that is badly needed. Reinforced Concrete Architecture will no doubt be a matter of growth and long development—Sir Owen Williams, Structural Engineer to the British Empire Exhibition, said some time ago:

> "Reinforced Concrete has passed its apprenticeship in Engineering, but has not yet entered upon its Architectural career, and there yet remains for the Architect to cut out the clothing material and have to use the structure itself for its own adornment."

which sums up the case fairly well. Concrete forms created by its plastic property can be made to produce an entirely novel effect, which usually appears terrifying to those of the stonemasonry tradition—loving school, for it brings about what appear to be rather revolutionary ideas. The absence of joints and the fluid-like form of concrete must be faced by us if we are to conceive a concrete architecture. Such architecture is the characteristic building expression of our age and the canons of design will be altered and a standard of its own will be created. Different relations of voids to solids, piers of small section and heavy loading standing over openings, varied lengths of span, etc., will cause us to forget classical precedent.

The surface treatment of concrete is destined to play a new role in buildings by the treatment of aggregate, a fluted surface, or other forms that may be adopted.

At the British Empire Exhibition the surface treatment of the concrete consists of deep horizontal rustications dividing the work up into horizontal layers, with a vertically fluted surface between the horizontal rustications, giving a very pleasing effect.

The horizontal rustication serves the purpose of masking the ugly irregular lines between each day's concreting.

One building in particular, the Stadium, has a very imposing front treated in concrete as shewn in the accompanying illustration.

An inexpensive and daring application of the principles of design to a new method of construction is seen in the church of Notre-Dame du Raincy, near Paris, which has been recently constructed entirely of Reinforced Concrete. The Church has greatly excited the interest of all nationalities, anxious to see this ingenuous exponent of what may be a modern movement.

Even if the construction is strongly criticised, it does express courageously a frank example of the architectural use of concrete. The church was constructed as shewn, mainly from the point of view of lack of funds and visible concrete was estimated as the cheapest form of construction.

We may condemn this new architecture, but we must not judge it by present standards for we have none to go by with these scientific constructional forms, and we have to realise they will, without doubt, become the expression of our Age. In Australia we have, like other countries, expressed ourselves structurally in concrete, but architecturally in stone; however, the time is ripe for much Architectural research work. Its plastic form and the possibility of good surface treatment of aggregate ought to help us to derive a pleasant and happy appearance for this structural material. Foundations and Fronts may be made of the same material, but it is to be hoped that this fact will not deter us from our experiments. Perhaps in the near future pleasing results carried out with concrete at the new Federal Capital City may bring to Australia the honour of having found a true expression.

BUILDERS' SCAFFOLDING

OUR City Building regulations provide that for the safety of pedestrians and others the pavements shall be protected overhead by timber framing, etc., but they do not appear to lay a great amount of stress upon the aesthetic appearance of the scaffolding, with the result that atrocities meet our gaze in every thoroughfare. Many of our most important buildings in course of erection have their front marred by bills and posters relating to various entertainments and qualifications of Oriental Conjurers and the advantages to be gained from the use of certain beverages. It is a great pity also that much of the lower hoardings are the storage grounds for local users of wood fuel; especially is this noticeable at sites on the fringes of the City.

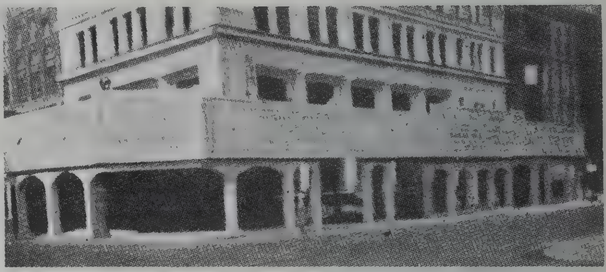
In the City itself, there is hardly a standard type of hoarding—the primary object of such an overhead projection is to prevent injury during construction.

Contractors also use the roofs of these structures to store materials instead of encumbering the fronts of the buildings and roadway.

Fundamentally the shed consists of a series of posts set at the curb line, on which rest girders braced to the posts and carrying the overhead planking. As a further means of protection against injury a parapet is often built on three exposed sides of the shed, high enough to conceal the materials stored on the platform and to prevent material from falling on the passers below. This combination of structural elements, properly calculated for the strength required, and without further adornment, satisfactorily meets the requirements of the Building Regulations.

It has become a general custom in erecting these sheds, to plan advertising space wherein to acquaint the public with the advantages of the building under construction and often adding a perspective of the proposed building painted more or less faithfully. The builder usually takes advantage of the opportunity presented to display his business announcement in a conspicuous manner.

In the past few years some architects have attempted to bring a great many owners to the realization that these shed-like structures, if properly treated, can be made into attractive bits of design and a powerful means of focusing public attention upon the work under construction. Owners may be shown that it is as much to their interest to erect slightly temporary structures as it is to erect a well designed building and that it is their civic duty to prevent, as far as it lies within their power, the erection of even temporary structures that are offensive to the public eye.

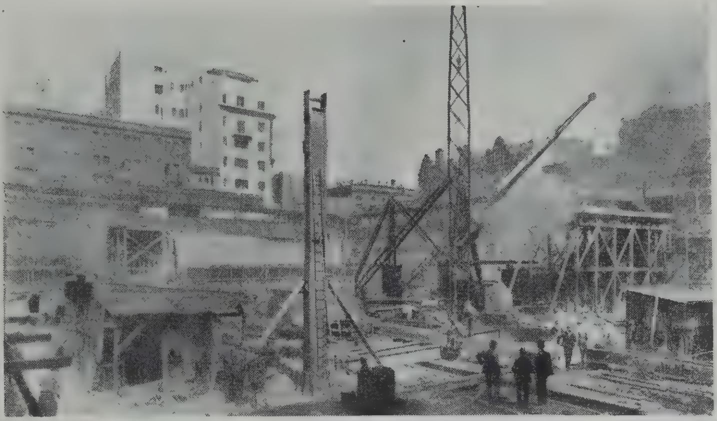


A Pleasing Treatment of Scaffolding, New York City.

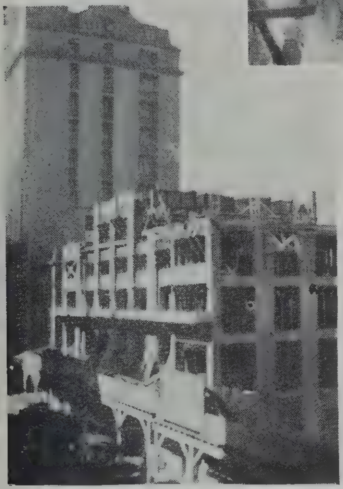
In Europe and many parts of the U.S.A. these structures are named "Builders' Arcades" and contain features of architectural interest. The placing of decorative motives and disposition of the panels, and grouping of parts appear to have been given careful study. Such matters as these can be allowed for in the Architect's Specification, and much attractivenes would be added to our city, and owners themselves would find it, as they have in some cases, distinctly to their advantage to erect a well designed protection structure.

Even from the contractor's point of view, a purpose may be served, especially if each contractor painted his structure a different colour to designate his firm. This is done in many cities of the U.S.A. and thus if one sees a pale grey "builder's arcade" it is a construction being carried out by "A" Company—olive green, "B" Company, and so on. These may appear unimportant civic matters, but everything that can be done to make our many building sites, which are often under construction for quite considerable periods, appear more pleasant and unobstrusive at pavement level will make our citizens more appreciative of what is the proper care for our city's improvement.

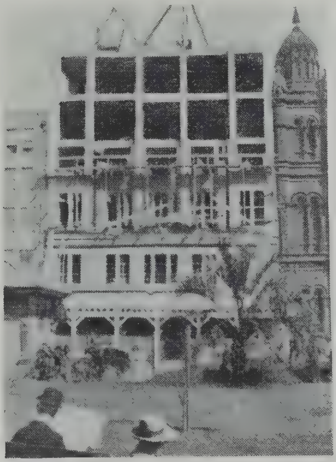
PROGRESS PHOTOS OF CITY BUILDINGS UNDER CONSTRUCTION



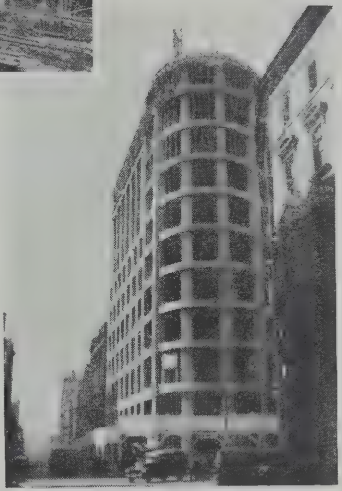
Messrs. David Jones' Ltd.,
New Service Store.
View on 7th September, 1925,



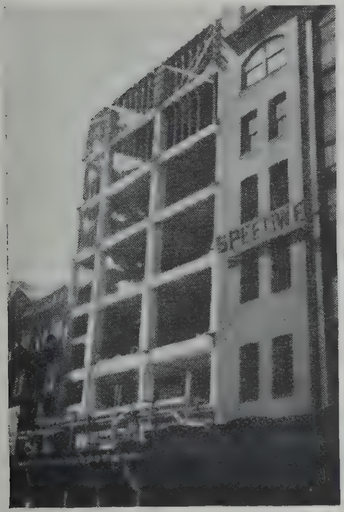
St. James' Theatre,
Castlereagh Street,
25th September, 1925.



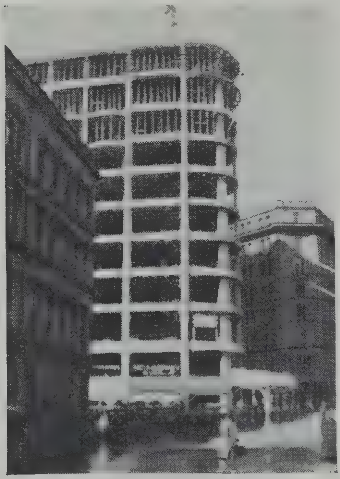
"Evening News" Office,
Elizabeth Street,
25th September, 1925.



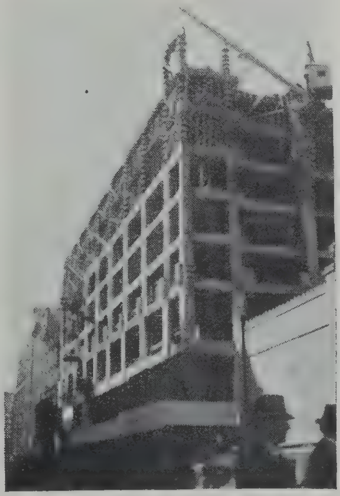
"S.M.H." Office,
Pitt Street,
25th September, 1925.



Messrs. Bennett & Wood, Ltd.
Pitt Street,
25th September, 1925.



"S.M.H." Office,
From Hunter Street,
25th September, 1925.



Government Savings Bank,
Castlereagh Street,
25th September, 1925.

REVIEW OF ENGINEERING BOOKS AND PERIODICALS

1. *TENTATIVE AUSTRALIAN STANDARD SPECIFICATION FOR STRUCTURAL STEEL AND AUSTRALIAN STANDARD ROLLED STEEL SECTIONS FOR STRUCTURAL PURPOSES.*

Published by the Australian Commonwealth Engineering Standards Association. Price 1/-

This is the first publication of the Association, whose second publication (Portland Cement) we reviewed in our last issue.

Like the specification on Cement, it is a tentative standard only. The first section is devoted to the standard specification for structural steel and is based upon the B.S. Specification, No. 15, 1912. The variations from this specification are given in a section in red type.

There is a complete variation between the number of tensile tests of the two specifications, the Australian spcification being rather more comprehensive in both this sub-section and the tests by chemical analysis. The appendix containing form of standard tensile test pieces is identical with that of the British standard specification. The second section devoted to Australian standard sections is based upon the B.S. Specification, No. 6, 1924, but is not as comprehensive. There is no section devoted to approximate formulae upon which the properties are based, as in the latter, but the same notation is adopted in the tables of dimensions:—

The variations from the B.S.S.-6-1924 are:—

Equal angles ..	17	sections	omitted	6	sections	added
Unequal angles	21	,,	,,	5	,,	,,
Tees	12	,,	,,	—		
Beams & Heavy Beams	7	,,	,,	1	,,	,,
Channels	8	,,	,,	1	,,	,,

No Standards for Bulb Angles and Bulb Plates as in the B.S.S.

The Specification is one of the most important of the Australian standard specifications that the Association will produce and it is to be hoped that it will not be many years before we can be assured of all these sections being available in Australian made material.

At present many of the sections given are not rolled in the Commonwealth and we look forward to the time when we can build throughout a steel framed building of Australian material, a proposition almost economically impossible at present.

2. *THEORY AND DESIGN OF STRUCTURES.*

Ewart S. Andrews, B.Sc., A.M.I.C.E.
Chapman and Hall, Publication.

The fourth edition of this text book for students, draughtsmen and engineers engaged in constructional work has recently been published. The work is one that can be thoroughly recommended and covers a wide range of structural design. The principles of design are well treated and numerous examples are included; illustrations are remarkably clear and much stress is laid upon graphical solutions of problems which are the most useful from a drawing office point of view.

This edition is enlarged by an added chapter on Columns, which the author treats very widely, and a list of the new B.S. Sections is added.

3. *THE STRENGTH OF MATERIALS.*

By the same Author and Publishers.

Recently the second edition of this work appeared and like the first edition it can be welcomed by students of materials and structures. The book is mainly devoted to the methods of failure in materials and the relation of these to structural design. In addition much matter is given on structural mechanics.

The Author of both of these books is well known as a consulting structural engineer in London and very many articles in the technical press have come from his pen.

Both volumes have for years past been found on the bookshelves of engineers of the English speaking countries and no doubt these will replace the old editions.

4. *CALCULATIONS FOR STEEL FRAME BUILDINGS.*

W. Cyril Cocking, M.I., Struct. E.
Scott, Greenwood & Son, Publishers.

This handy volume devoted to the practical design of the modern building of steel framed construction is one of the Broadway Engineering Handbooks to which series Mr. Ewart S. Andrews' useful little book on "The Elementary Principles of Reinforced Concrete" belongs, and which was the first of the series.

Mr. Cocking has in the production of this work given to structural engineers well solved examples of actual pieces of design that are likely to be met with in practice. The attitude adopted is that of treating the subject from the practical designers' point of view. The calculations are based upon the requirements of the Steel Frame Act of the London County Council and are complete for a steel-framed warehouse building. Typical design sheets are included and plans for the warehouse considered, while the general letterpress contains many approximate formulae and pieces of design, such as rivetted joints, lattice frames, wall bearing, etc., which ought to prove useful to students of structural design and members of any drawing office staff.

Theoretically trained graduates ought to find it adds the necessary link between the lecture room and the outside drawing office.

5. *STRUCTURAL DESIGN IN STEEL FRAME BUILDINGS.*

Percy J. Waldram. B.T. Batsford, Publishers.

This book is one of a collectoin of half a dozen practical examples in structural design that are likely to be met with in daily practice.

Examples given are for a compound girder, a plate web girder, two types of stancheons, a grillage foundation and a steel mansard room frame. Practical hints relating to estimating and structural problems are given in the early part of the book, which is clearly printed and of a size 11⅛in. x 7½in.

The examples have appeared from time to time in the "Architects' Journal" of London about the years 1915-16 and are here reprinted and collected in book form.

The reasoning of the problems is quite good, but there is rather a lack of decisiveness in treatment. The question of grillage foundations is not one of great moment of this country, as it is in England, also the treatment of the steel mansard roof is one that is not met with much here, whereas in Great Britain owing to building regulations, it is a definite feature of nearly all city buildings, which are in practically all cases of steel frame construction, and not of concrete, despite the low building height limit of eighty feet. However, the designs add an interesting collection to the vast amount of structural engineering literature that is published yearly.

WIND—ITS EFFECT UPON BUILDINGS

By N. WARREN-WATERHOUSE, B.E., A.M.I., Struct. E.

WIND pressure upon all forms of structures has since 1881 been recognised by regulations as producing an effect that must be taken into account in design. Before this date no definite restrictions were placed by bodies controlling structural design on the construction of bridges and buildings, which would be affected on account of wind pressure. The Board of Trade and the London County Council were the two bodies who first imposed restrictions—the former on Bridges, the latter on Buildings.

In Australia, the various City regulations govern the value to be taken for wind pressure, to be allowed for in the design of Buildings and their roofs and these appear to be based upon European or American practice. The values included in the Regulations of the City of Sydney are forty (40) pounds per square foot on the vertical plane from the ridge to the eaves on either side for *all roofs* inclined upwards at a great angle than twenty (20) degrees with the horizontal. As regards the *Buildings* themselves, the regulations are that all buildings whose height exceeds four times their least width shall be designed to resist a horizontal wind pressure of not less than twenty (20) pounds per sq. foot of the whole projected surface normal to the direction of the wind. For the case of *panels in an external wall* the wall shall be designed for a pressure of thirty (30) pounds per square foot. *For towers and other parts which extend above the roof,* flat or gutter of a building they must be designed to withstand a pressure of forty (40) pounds per sq. foot of the whole projected surface normal to the direction of the wind.

The Concrete regulations of the London County Council relating to allowance for wind pressure on roofs and buildings are as follows:—

1. *All Buildings* shall be so designed as to resist safely a horizontal pressure equivalent to a static pressure of not less than twenty (20) pounds per sq. foot of the whole projected surface normal to the direction of every wind.

2. All Structures or other attachments whatsoever in connection with a building, *including towers or other parts which extend above the roof flat or gutter* adjoining thereto, shall be so designed as to resist safely a horizontal pressure equivalent to a static pressure of not less than forty (40) pounds per sq. foot of the whole projected surface normal to the direction of every wind.

3. *Each panel in any external wall* shall be designed to resist safely a horizontal pressure equivalent to a static pressure of at least thirty (30) pounds per sq. foot assumed to be acting over the area of one panel from either side.

The regulations of this body regarding Steel Framed buildings are as follows:—

1. *All Buildings* shall be so designed as to resist safely a wind pressure in any horizontal direction of not less than thirty (30) pounds per sq. foot of the upper two thirds of the surface of such buildings exposed to wind pressure.

2. *For a Roof,* the plane of which inclines upwards at a greater angle than twenty degrees (20 degrees) with the horizontal, the wind pressure shall be estimated at twenty-eight (28) pounds per sq. foot of sloping surface.

TABLE OF COEFFICIENTS FOR VARIOUS ROOF INCLINATIONS

Angle of Roof	5°	10°	20°	30°	40°	50°	60°	70°	$\frac{Span}{4}$ (26½°)
Coefficient	·125	24	45	66	·83	·95	1·00	1·02	59

TABLE NO. 1.

For all other roofs the superimposed load shall be estimated at fifty-six (56) pounds per sq. foot, measured on a horizontal plane. The Sydney regulations are similar for *all other, roofs,* as here.

This latter clause is an allowance more for a general superimposed load that is likely to occur with a flat roof which might be used for storage of goods, traffic of persons, etc. Most regulations differ in values and all appear to be in excess of what is really likely to occur, except in occasional circumstances.

A pressure of 56lbs. per sq. foot appears to have only been recorded once in forty years and this was at the Forth Bridge—it is this value that the B.O.T. require to be allowed for in Bridge Design.

The three principal methods of measuring experimentally, pressure due to wind are:—

1. By calculating the pressure necessary to overturn railway carriages, which have been overturned by the wind and the maximum pressure by this method is about 30lbs. per sq. foot.

2. By measuring the velocity of wind by anemometer and deducing the pressure from values obtained.

3. By measuring the pressure on plates exposed to the wind.

For proportioning roof framework where regulations are not governing factors, a value for horizontal wind pressure may be taken from 30 to 40 lbs. per sq. foot of *vertical surface taken as acting normally to the roof surface.* When a horizontal force of wind strikes an inclined surface it causes a normal pressure upon that surface, and the intensity of this pressure has been deduced from experiments by various investigators. The component of the horizontal wind pressure taken normal to the roof only, will produce stress in the purlins and principals, the component acting along the slope will not, except very slightly, due to friction, affect the stresses in the roof.

Empirical formulae (for the intensity of pressure) have been derived by Hutton, Duchemin and others, whose equations are usually given in textbooks on structural mechanics, for the relation between the horizontal and normal wind pressures. A useful straight line formula giving the relation between P, the horizontal wind pressure in lbs. per sq. foot and P_N, the wind pressure normal to the surface of the roof in lbs. per sq. foot, where θ is the angle of the surface of the roof with the horizontal expressed in degrees, is

$$P_N = \frac{P \times \theta}{45}$$

RELATION BETWEEN VELOCITY AND PRESSURE

Velocity in Miles per Hour	Pressure in lbs. per sq. ft	Description of Wind
10	·36	Fresh Breeze
20	1·4	Stiff "
30	3·24	Strong Wind
40	5·76	High "
50	9·00	Storm
60	12·96	Violent Storm
80	23·04	Hurricane
100	36·00	Violent Hurricane

TABLE NO. 2.

This is used when the angle is less than 45 degrees; for roofs having a slope exceeding 45 degrees, the full horizontal pressure is used.

The table No. 1 shows coefficients for the determination of wind pressure normal to the roof surface, the horizontal wind pressure being assumed.

e.g. If P, the pressure parallel to the direction of the wind is 32lbs. per sq. foot, then P_N.. the pressure normal to roof surface is 32 x .56 = 18lbs. per sq. foot.

for a roof slope of 24½ degrees.

The pressure on roof structures, like all other structures, varies with the height from the ground, being greater as the height increases and with velocity. Pressure increases due to velocity increase are shown in table No. 2—the pressures are in lbs. per sq. foot on a flat surface normal to the direction of the wind for different velocities.

Lattice structures have a greater pressure per sq. foot than a solid rectangle of similar overall dimensions and the wind appears to assume similar streams as when water passes obstructions.

Experiments carried out on various surfaces show that the pressure of wind on an inclined surface is greater at the bottom of the incline than at the top, thus the pressure on a roof surface is greater at the eaves than at the ridge. With different types of buildings the wind effects are varied, for example, in the case of roofs to open buildings erected in exposed positions there is an uplifting effect, the wind acting upon the inner surface of the leeward side of the building. Cases have occurred where this uplifting effect has been great, and care should always be taken that the roof is of sufficient weight to prevent serious reversals of stress.

In grandstands and pavilions open on one side only, this lifting effect will be more noticeable—the wind blowing in on the open side finding no exit, causes a Cushion effect which transmits the horizontal pressure of the wind vertically against the roof. Openings left at points under the rear will relieve the effect.

Another effect in roofs is that of a negative drag or suction effect which occurs on the leeward side of a roof subjected to horizontal wind pressure.

Experiments have shown that the wind force acting horizontally is divided into two components, one normal to the roof surface, which we have already considered and one parallel to the roof slope which flows as a stream force tending to curl over the ridge and exert a negative pressure or suction on the lee side. Such an effect causes a reversal of the stresses in the members of the truss, thus ties may become subjected to thrust instead of tension.

At the Natural Physical Laboratory, experiments have shown that this suction pressure does exist and Dr. T. E. Stanton has shown that the negative pressure on the lee side may cause a great difference in the stresses of the various members. For roof-angles of 30 degrees and 45 degrees negative pressure exceeded greatly the positive pressure on the windward side.

The windward pressure and the leeward suction vary accordingly to three types of roof arrangement as follows:—

Type (1) Roof supported on columns and wind passing straight through.

Type (2) Roof constructed so that a pressure is possible within the building.

Type (3) Roof to a building, with the internal surface protected from wind pressure.

Coefficients based upon experiments carried out by Dr. Stanton, for these types have been deduced and can be applied to practical cases, and the stress diagram for the particular roof may be varied according to the effect.

The case of all buildings subjected to wind pressure is one that requires much consideration for those of light construction in steelwork, the steel framing being made to provide all resistance to the wind.

Not only is it shape and form that influences wind pressure on buildings, but their situation and the velocity and pressure of the wind increase with the height of the building from the ground.

In buildings where the proportion of height to width of base is not excessive, the actual dead load of the building is sufficient to resist overturning. In high narrow buildings resembling towers, the wind pressure may cause tension on the windward columns and cause an unlift on the foundations.

In Australia the question of wind pressure in large buildings has not been greatly considered in design, as with the usual form of construction, viz., reinforced concrete, the dead load is sufficient to resist bodily overturning.

For design purposes each building has to be considered upon its own merits, but in general a pressure of 30 lbs. per sq. ft. of exposed surface may be taken for all members supporting an area of 300 sq. ft. or less. It is interesting to note that the resistance of ordinary glass windows is about 30 lbs. per sq. ft. front pressure.

Heavy structures are safer against overturning and the ordinary steady wind pressure is sufficient to allow for and a large structure is much more stable than a small one of similar type.

In Australia it is rarely ever necessary to consider a wind pressure exceeding 50 lb. per sq. ft.—perhaps in structures over 150ft., this value will be the maximum. Large buildings of early days such as those of mediaeval character, were not designed for wind pressure and have withstood severe pressures, but this is due no doubt to the facts that have been observed from experiments, viz., that the highest pressure over a large surface is lower than the maximum pressure upon a small surface.

Values for wind pressure appear in past recommendations to be rather high and a decrease in allowance is, without doubt, justifiable, but there is much enlightenment required in connection with the values for wind pressure generally.

The form of the structure has a great effect on the problem, and special structures such as elevated towers, cranes, etc., are often designed for a certain wind pressure, which does not always appear to be satisfying. Most authorities differ in the values they suggest, and even there appears to be confusion in our own city regulations for wind pressure on external walls.

In Section 23 relating to wind pressure, a value of 30 lbs. per sq. ft. is recommended for "any external wall"; again in section 137, a value of 20 lbs. is suggested for "external walls"; perhaps someday this contradictory statement will be decided and we shall be given a definite value.

SMALL SCALE SEWAGE DISPOSAL

By A. O. MENDELSOHN, B.Sc., F.C.S., A.A.C.I., Lon.

Bacteriologist and Public Analyst

YEAR by year the gulf has been lessened between the comforts of the city and the primitive conditions of country life. The automobile, telephone and wireless set have annihilated distance. And so far as creature comforts are concerned, ways and means have gradually been devised to make the country home a self-contained system. An electric plant gives all the advantages of connection to a city main, and it is practicable and economical to build in a sewerage treatment tank which is a miniature Board of Works Installation.

The modern home treatment of sewerage is an interesting example of the intelligent control of natural principles. In a general way, all living things are injured, and perhaps destroyed, if kept in contact with their own waste products. Yeast cells die out when the alcohol they make rises above a certain percentage. Mankind is exposed to grave danger from undue contact with its own waste (expired air, urine, faeces, sweat). Mother Nature has so adjusted her scheme of things that a process of purification is perpetually going on, and this scheme is just an inversion of an old proverb for purification in Nature is effected by making one creature's poison another creature's meat. The harmful waste products of man become the wholesome food of bacterial and higher forms of life.

Human waste can be treated by methods of varying efficiency:

1. *By Fire.*—Tedious, unpleasant, and expensive.

2. *By Chemical Sterilization and Deodorising* (or rather odour-disguising).—Expensive and inefficient, and the method has the defect of making the waiste very resistant to subsequent natural action.

3. *By Bacterial Decomposition.*—The natural method, and the only one to be described herein.

Faecal matter varies greatly. In general it consists of the residue of our food supply, greatly altered by digestive and bacterial action during its passage through the body. Now usually the body receives a greater food supply than it needs or can utilize and the faeces contain a still considerable amount of protein and fatty foodstuff. Waste from hospitals is frequently of an abnormal character, as might be expected. All faecal material swarms with living and dead bacteria.

Technically, faecal and other waste becomes "sewerage" when it has been passed from the body and is ready to undergo some form of treatment.

The object of treating sewerage is to transform an objectionable and potentially dangerous material into an unobjectionable and wholesome and harmless one. This transformation takes place in nature by the agency of bacteria—those minute living organisms intermediate between plant and animal life, which swarm everywhere, but especially in damp and dark places.

We too often associate bacteria or germs or microbes or micro-organisms (for the terms are interchangeable) with disease and pestilence and filth. Yet the beneficient organisms far out-number the disease-producing (or pathogenic) ones. The economic value of many types of bacteria is becoming increasingly recognised, and the view is gaining currency that human life cannot continue aseptically (or in the absence of bacteria). As far as sewerage treatment is involved, we are concerned with two main groups of bacteria, the aerobes, which can only act in the presence of air (i.e. oxygen), and the anaerobes, which flourish only in the absence of it. There are also a number of organisms called facultative anaerobes, which are indifferent, acting whether oxygen be absent or present.

In a general way, though the description is not a rigidly accurate one, aerobes break down complex dead material into simpler products without the production of offensive-smelling bodies, while anaerobes decompose the same matter with the production of compounds of vile odour. To the latter sort of action we usually give the name "putrefaction." When soup or egg or meat goes bad, or milk sours, the action is largely anaerobic. Putrefaction of solid material is usually preceded by a liquifying action.

All normal soil teems with bacteria, and it is familiar to everyone that the ground is the great purifying crucible of nature. Burying the solid sewerage in the soil is the simplest and most-efficient method of disposal, given suitable absorbent earth, and a sufficient area (for bacterial action ceases a few feet below the surface). This type of disposal is ideal for suitably located towns, and would also be quite satisfactory for most house units, but for the repulsive nature of the task of burial. The storage of the sewerage until it is ready for disposal is another serious drawback, both so far as odour is concerned and also because the material is a breeding ground for fly larvae.

The Septic Tank.—This is the only efficient, hygienic and inoffensive method of treating sewerage on the small scale. There is still a good deal of prejudice in some quarters against the installation of septic tanks. This is probably due to the unfortunate name, for the term "septic" is an unpleasant one, with nasty associations. Another reason is doubtless the recollection of the nuisance resulting from the installation of some of the older experimental designs in tanks, which were little more than cesspits.

A modern tank consists essentially of two parts—a first chamber in which anaerobic action goes on, resulting in a liquifaction and partial decomposition, and a second section, essentially a filter bed, to which the air has more or less free access. The liquified sewerage slowly trickles over this filter bed, on which a luxuriant aerobic bacterial life develops, and here decomposition and purification are completed.

Foodstuffs are roughly divided into three classes:—

Carbohydrates.—Sugars and starches, and also most fibrous and woody material.

Fats and Oils.—Dripping, butter, lard, olive oil, etc.
Protein.—Albumen, casein (of milk), etc.

The proteins are distinguished from all other foodstuffs in the fact that they contain the element nitrogen in combination. Sewerage contains little carbohydrate. Fats are very resistant to bacterial action, and in any case give little trouble, for they do not putrify and are fairly readily treated by mechanical means such as gravitation in grease taps. Sewerage treatment is essentially action upon the nitrogenous matter it contains. Natural bacterial action upon decaying nitrogenous matter is an amazingly complex and interesting example of a ceaseless cycle of chemical operations, wherein the plant, the animal, and the plant-animal (or bacterium) all fill their appropriate roles. Protein is essential to animal life, human and other, but animals, unlike plants, cannot build up protein from simple nitrogenous compounds. The plant builds up the protein and the animal gets *its* protein by eating the plant, or in the case of a carnivorous animal, by eating some other animal. The omnivorous (or mixed-diet) animal, *Man,* eats both plants and animals. Human faeces, as already explained, contains a considerable amount of partially broken-down nitrogenous matter, and the question is—How does nature transform this foul material into wholesome simple compounds ready to be built up again by the plant into protein? The operation is customarily called "The Nitrogen Cycle" and broadly follows the scheme shown below.

(a) A group of bacteria break down and reduce the combined nitrogen to form ammonia, NH_3.

(b) A second group oxidize this ammonia to nitrous acid HNO_2 (combined, of course, with available bases as nitrites).

(c) A third group oxidize this material further to form nitric acid HNO_3 (combined as nitrates).

(d) The plant can utilize nitrates to build up the complex protein.

(e) The animal consumes the protein, part of it being changed and rejected as faeces, ready to undergo action (a), and the cycle commences anew.

Broadly, oxidation is purification, if all the putrifiable nitrogenous matter has been oxodized to the form of nitrate, the effluent is said to be stable and nonputrescible. By suitable construction, and where cost is not a primary consideration it is quite possible to produce an effluent of any required degree of purity—absolutely odourless and literally fit to drink. In some cases a fairly high purification ratio is necessary, as for example when the site is such that the effluent from the tank must run into a street channel. In many cases, however, where the effluent is being absorbed in the soil, such high preliminary purification is unnecessary, for the earth bacteria will rapidly and efficiently complete the purification.

The intelligent utilization of the untold hordes of Nature's scavengers for the purification of sewage and other wastes is a subject it surely behoves every architect to master.

VISIT TO CANBERRA

On Saturday, the 19th September, headed by our genial President, Sir Charles Rosenthal, a party of some 26 Architects, accompanied by representative Master Builders visited Canberra and spent the day sightseeing in the new Capital and environs. During the morning visits were paid to the Civic Centre, Ainslie Hotel and Residences, War Memorial Site, Acton Hotel Site, Parliament House, Secretarial Building, Hotel Kurrajong, Power House, Eastlake Residences and Shopping Centre, and to Residences at Blandfordia, and in the afternoon to the Brickworks, Nursery and Cotter Dam. All were much impressed by what they saw, and surprised at the amount of work already carried out. It was particularly noted that the work of constructing the Capital is being carried out on sound lines, the fundamental services of lighting and water supply, roads and drainage being already largely completed. The party was very much interested in the area selected for the proposed National War Memorial, and it was generally agreed that no finer site could be chosen, and intending competitors should certainly carefully study a setting so full of inspiration. Parliament House was found to be in an advanced stage of construction, and much interest was shown in the general arrangement and design of the building. Although differences of opinion were freely expressed as to the design and external treatment of the buildings, and some felt that more use of brick in the exteriors might be made, the general impression was that in country such as that at Canberra, the lighter tones secured by plastered exteriors gave a much needed relief to the rather sombre effect of the red tiles and bricks. An effort is being made to burn tiles of varying tints with success, and no doubt as time goes on bricks of varying colour will also be burnt. The run out to the Cotter Dam was much enjoyed, and all felt repaid for the time involved in making the trip by the spectacle of the completed dam with the water pouring over the weir. On the return journey the Nursery was visited, and although the time available for inspection was short, a good idea was obtained of the valuable work being done.

The party during the tour of inspection was shown every consideration by the local Officer, who gave a splendid idea of what is being done to develop Australia's Capital City. The Canberra Master Builders' Association officially welcomed the visitors during the afternoon, and were later the guests of the Institute at dinner. The party was accommodated at the Hotel Canberra, the appointments and attention being favourably commented on by all. For the satisfactory arrangements made for the party in general, the Institute's Secretary, Miss Jaggers, deserves the highest praise, whose reward is the success attendant upon the venture, which should bring home to those who did not avail themselves of this unique opportunity to visit, under the most favourable conditions, a national work of importance, a sense of missed opportunities, and it is hoped that when other visits are made in the future that a greater number will not be posted absent.

J. F. M.

NOTICE TO ARCHITECTS!

COMPETITION FOR HONOUR ROLL FOR THE INSTITUTE OF ARCHITECTS OF NEW SOUTH WALES.

Members are invited to submit designs for an Honour Roll for the Institute, which is to take the form of a blackwood or maple panel, rectangular in shape, to suit the proportions of the Southern end of the Common Room. Incorporated in the design it is suggested that the seal of the Institute might be suitably introduced, the inscriptions would be incised and gilded. Any Member of the Institute may submit a design, and the Adjudicators will be the Council of the Institute. It is felt that in a Memorial of this character it is unnecessary to offer a premium. Space for about 50 or 60 names should be allowed, as well as space for inscribing the names of Architects who served, but who are not yet members of the Institute. Designs must reach the Secretary not later than the 31st day of October, without any distinguishing mark, but the name of the author must be attached in a sealed envelope to the design.

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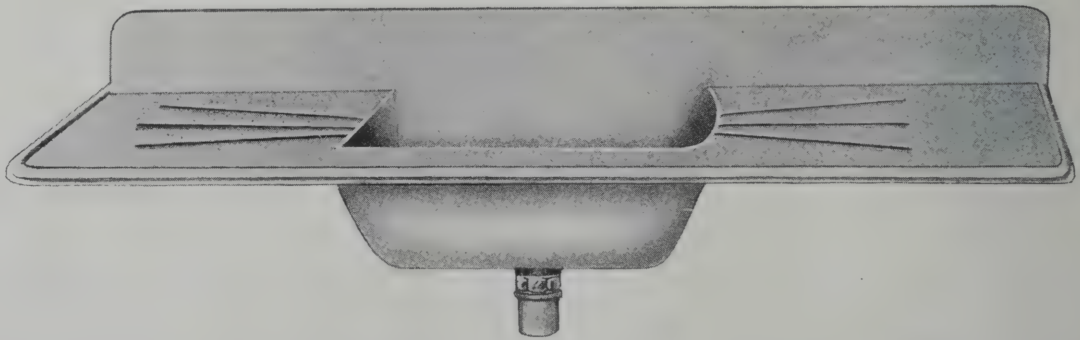

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ARCHITECTURE

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November, 1925

INSTITUTE OF ARCHITECTS OF NEW SOUTH WALES

MONTHLY MEETING

TUESDAY, 6th OCTOBER 1925

MR. HOOK, Vice-President, occupied the chair. Apologies for non-attendance were received from Sir Charles Rosenthal, Messrs. Peddle, Moore, Mills and Nelson.

Minutes of previous meeting were taken as read and confirmed.

NEW MEMBERS: Messrs. John C. Aisbett and G. Penn Bradley were welcomed by the Chairman.

The Chairman announced that the lecture for the meeting, to be held on 3rd November, would be entitled "The Garden and the Home," and would be delivered by Professor E. G. Waterhouse.

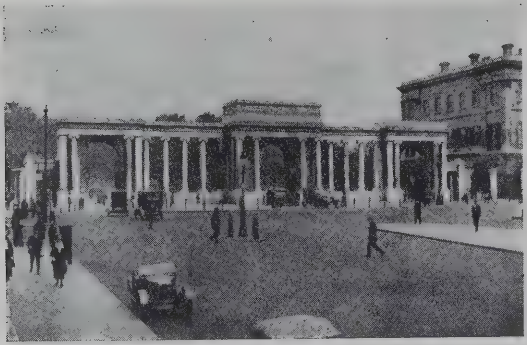
The Chairman announced that members were invited to submit designs for an Honour Roll for the Institute.

Mr. Norman Weekes then delivered the lecture of the evening, entitled "The Architecture of Cities."

At the close of the lecture, Mr. Waterhouse, in proposing a vote of thanks to the speaker, said: "I think this is the second or third occasion that Mr. Weekes has addressed this Institute. The unfortunate part of it is that only members of the Institute have the opportunity of hearing the lectures. An effort should be made to extend the lectures to a far wider field. Citizens would then know what is being done. Elizabeth Street gives an opportunity of doing something worthy of the City. When remodelled, things will be out of proportion unless dealt with by architects. Not only the buildings, but the final appearance of the street must be considered. Mr. Weekes, as Director of the Sydney Regional Plan, is doing much to help the city."

Mr. Weston and Colonel Hurst supported the vote of thanks to the Lecturer.

It was decided to suggest to Council that the kindred Societies be asked to co-operate with the Institute, with a view to making further protest against the congested state of the Sydney Railway Station, and unsightly advertisements.



Apsley Gate, Hyde Park, London.

Design for Monumental Gateway Entrance to Anzac Parade, Sydney.

THE ARCHITECTURE OF CITIES

By NORMAN WEEKES, A.R.I.B.A.

I have selected the subject conscious of it being unorthodox, but no one having seen the texture, beauty and grace of form where cypress trees are seen in relation to examples of classic architecture, related also one to another, could fail to appreciate that a true conception of the term architecture embraces the aesthetic design of every structural element combining to form a group.

To restrict the term architecture to independent units in the building of a city is to overlook the fundamental principle which is the presentation of any constructional feature with an aesthetic motive—independently or collectively.

The architecture of cities embraces not only the motifs formulated into buildings, but the aesthetic design of those engineering features and general utilities which are necessary elements in community growth, and not only of achieving or preserving a harmonious relationship between all the works of man but between these and the works of nature.

We must realise that the architecture of cities is something more than the mere convenient arrangement of sites and buildings or as an abstract to be taken in small doses with reluctance or distaste.

There are few who do not appreciate, and many are exacting with regard to the furnishing of their home, its interior or exterior, the layout of the garden and the convenience of the office or workshop, whilst the aspect of our streets and public services in their purpose and relation one to another passes almost unnoticed, yet they demand our notice with greater urgency. It is not a question of whether we will accept or refuse, for the constructions of the city's composite elements goes on whether or no, and there are enough existing cities with architectural character regarded as a whole, for comparison with the far greater number that have been allowed to grow in complete disregard of this essential.

The term architecture related to the city as a whole is unfortunate to have become superceded by the crude modernism called Town Planning—in a building, the plan is inseparably bound up with the elevation, and yet the development of public interest in a city's growth is restricted by the use of this term, town planning, and the equal essential of elevation is still apparently confined to a few specialists, regarded often as impossible idealists; yet city architecture, town planning, or regional planning, call it what one may, is the precipitate or permanent record of the attitude toward life of the aggregate thought of a community.

While it is never necessary or desirable to copy what has been done in the past, yet retrospective impression of technique is valuable and is best obtained historically—it gives a power of vision beneficial to the outlook on our immediate problems, and the outline or skeleton principles around which the architects or town planner of a city can weave life, form and colour appropriate to the city of the present and the future.

I would ask permission here to introduce a few illustrations where these principles have been followed with advantage to the communities, from which seven typical examples have been selected for illustrating this article.

Residential Street, Brookline, Massachusetts, U.S.A.

Avenue, Passadena, California.

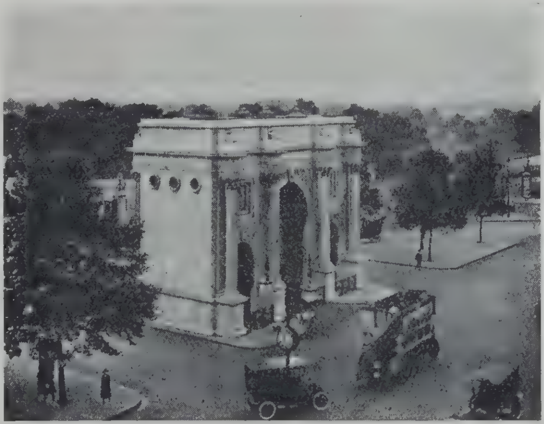
With regard to city development the Apsley Gate, Hyde Park Corner, London, is a beautiful example of monumental architecture in the classic tradition correctly fulfilling its function as an opening or entrance to a park, expressing in stone the note of nature's handiwork within; the texture form and life expressed in the trees provides just that setting which shows the stonework to advantage, and with the wide open roadway in the foreground, also receiving architectural treatment, the whole combines to form a group where utilitarian construction is truly expressed with an aesthetic motive.

The Marble Arch, Hyde Park, is another example responding to the same description, except for the isolated trees immediately adjacent which illustrate the right thing wrongly placed. The Brandenberg Gateway entrance to the Unter den Linden, Berlin, and the gateway entrance to the Frederiksplatz, Copenhagen, like the design here illustrated for the entrance to Anzac Parade, have all the purity of classic tradition. The design is for a memorial gateway to the memory of the Anzacs and conceived in a monumental scale with appropriate simplicity and symbolism. The gateway, a triumphal structure in pleasing variation to the traditional arch, stands appropriately at the head of Anzac Parade on the outer circle of the intersection and is incorporated in an open screen colonade in the Doric order; it is of semi-circular form from Moore Park Road to Dowling Street, and opens out upon the park lands, through it can be seen the fine avenue of fig trees along the parade which the scheme seeks to preserve, and in the distance the campanile of the Grandstand and other buildings in the Royal Show Grounds.

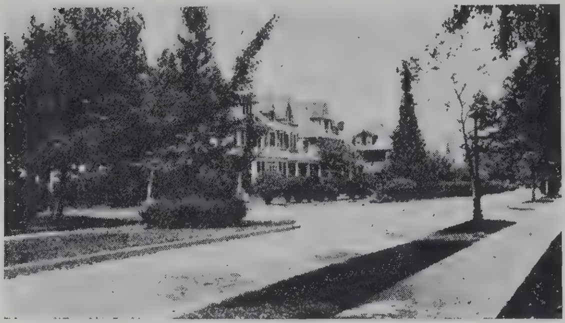
As a gateway to the city on what is the main southern highway, it is particularly well located and appropriate, as an entrance gateway from the city to the great recreation area of Sydney, it is equally successful, and as a permanent memorial to the men of Anzac it may be truly regarded as the Gateway of the State at its great capital city, for it was the foundation of the national structure which their sacrifice laid.

The gateway itself is conceived as typifying perpetual life, a monument great enough to indicate the regard in which their sacrifice is held by those remaining with the simplicity which exemplifies its purity of purpose.

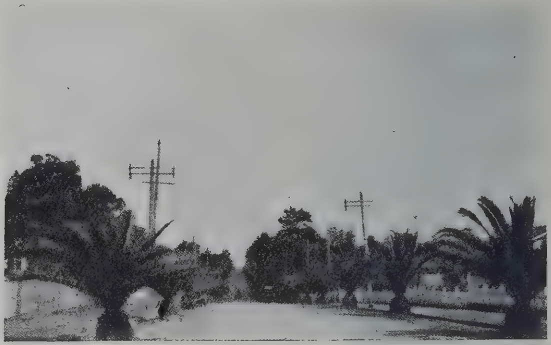
In the same tradition that the Imperial Cenotaph is in Whitehall, on the main thoroughfare where most people congregate, the gateway is placed across the main arterial route, where the greatest number of citizens are concentrated at a time when they have most reason to become conscious of the gratitude they owe to those who made the sacrifice that they may have freedom to enjoy the pleasures that lie beyond the gateway.



Marble Arch, Hyde Park, London.



East 17th Street, Flatbush Avenue, Brooklyn, New York.



Victoria Street, Ashfield, Sydney.

The entablature of the gateway is surmounted with a beautiful composition in bronze; contrary to the customary impedimental of war or the association of death, there is depicted appropriately the angel of peace, reflecting the light and hope of peace as the purpose of those who have gone before; at the base on either side it, is guarded by two griffins, expressing the support of the highest intelligence and strength of the animal world.

Two censors signify the burning of the perpetual fire of life which the inspiration of their sacrifice keeps ever alight.

The keynote is not a succumbing to the sombreness of death but depicts in the present a triumphant overcoming of peace over war, of life over death.

Bearing in mind that the creation of this monument is a practical immediate possibility, if not, in fact, a necessity by the growing needs of traffic, and the site which will afford the least possible expense and provide a well-designed traffic centre as an example equal to any city in the world.

With regard to residential development, there are three American and one Australian examples.

The house apparently set in a grove of trees, is, in fact, a residential street in Brookline, Massachusetts, and represents probably the highest standard yet achieved in residential development —the house itself is designed in what is accepted as the new England colonial style, expressing in a temperate climate a domestic interpretation of the monumental architecture of the classic period of Greece and Rome; the preservation of the naturally planted trees wholly the work of nature, and the beautifully curved footway and roadway, where the simple requirements of utility are achieved with the merit of economy, utility and beauty combined, the whole forms an architectural group of exceptional merit.

The second example, an Avenue in Passadena, California, is chosen as combining the same features applied to a main highway, the trees, the shrubs, the flowers, and the grass are retained in their proper relationship to the carriage and footways. This example illustrates the principle that grass margins are correct where the impression is given that the roadways are curved through a grass expanse, and they are fundamentally wrong where the converse is the case, since it is not natural for grass to grow out of expansive impervious paving.

For the third American example, I am somewise personally responsible, in having designed this sub-division located in Brooklyn, New York; here a more formal treatment is expressed, and it will be noticed that each element in the group, houses, roadways, footways, tree shrubs are all architecturally treated, and constitute an architectural composition.

The last example is an avenue of palms in Ashfield, Sydney, with equal potential for architectural street composition, but with, as yet, no other contributory element to complete the group; many similar examples occur in the suburbs of Sydney with wonderful architectural possibilities, if given comprehensive vision, and which would with equal merit respond to architectural treatment as composite groups, thus even the simple aspects of city development are capable of, and rightly justify, the designation "architecture of cities."

ARCHITECTURE AND ITS PLACE IN A GENERAL EDUCATION

By SIR BANISTER FLETCHER, F.R.I.B.A.

PART I. ARCHITECTURE

AS we glance along the perspective of past ages, we can find in architecture of each period a lithic history which indicates conditions of existence with far greater certainty than that written by men in more perishable materials. Thus the building art reflects the history of each period, and is an index of the social and political condition of the people and of those great religious and historical events which are landmarks in the history of mankind.

Architecture, then, may be said to be the result of and inseparable from history, because the work of man in each period is before us in the mighty structures of past civilisations. By the study of architecture we learn of the conditions, hopes, fears, and the very thoughts of the peoples of bygone days as certainly as, if not more surely than, by the contemporary written chronicles, though not with the same degree of continuity. The advancement of civilisation is manifest in architecture, which presents so noble a field for the display of the grand and the beautiful, and which at the same time is so intimately connected with the essentials of life.

In creations of surpassing excellence the painter and the sculptor may display their individual genius, but it is on the great monuments of architectural taste and manificence that the genius of a nation is unmistakably stamped. The Egyptian, the Greek, the Saracen, the Mediaevalist—what a key their respective styles afford to the character and conditions of those peoples

In pre-historic days man in his savage state required but shelter from the elements, from wild beasts and human enemies, and this he obtained by means of the natural cave, the hut of "wattle-and daub," or the tent. No buildings remain to show us the evolutions of form which took place during the period between that far-off time and the earliest historic architecture.

Architectural history can be divided into two main groups, viz., Historical, i.e., styles evolved from a parent stem and influencing other styles; and Non-historical, i.e., styles developed independently and having little direct influence on other styles.

Let us consider "Historical" or European architecture, together with Egyptian and Assyrian, by which it was influenced in its aspect as a record of the history of the nations of Europe, leaving aside the second group, which includes Indian, Chinese, Japanese, Peruvian, Mexican, and Sacacenic, as these have exerted only a limited influence on European architecture.

Egypt is the first to claim our attention, and there we find, dating from about B.C. 5000, the first great attempts at permanent constructions. Appropriately is the Sphinx at Ghizeh, placed as a sentinel forbidding us, as it were, to know by what long stages of evolution historic architecture has come to life. Built nearly B.C. 4000, the Pyramids represent the governing idea of the Egyptian faith—viz., that immortality could be insured, by the preservation of the mummy secured in such everlasting mounds of masonry that their construction, even in these days of engineering skill, is a wonder to the world. We glean from the Pyramids, mastabas, and rock-cut temples the Egyptians' strong belief in a future state, the existence of a powerful priesthood, and the significance of the traditional, unchangeable, and mysterious religious rites. Herodotus informs us that the dwelling-house was regarded as a temporary lodging, the tomb being the permanent about of the spirit. The temples, with entrances made imposing by splendid avenues, by sphinxes, alike in their painted hieroglyphics, mysterious planning, and forbidding aspect, tell us of the exclusiveness of the Egyptian religion, for they were not places of worship for the people, but rather sanctuaries for the kings and priests.

These massive buildings would have been impossible without a despotic government and the forced labor of a vast and submissive population of slaves and captive foreigners. who probably received no other reward than their food.

We next turn our attention to the architecture of Western Asia, which indicates that the Assyrians and Persians were warriors, to whom alike warlike deeds and conquest were more congenial than the erection of stupendous tomb-houses.

Temples were unnecessary, as sacrifices were conducted in the open-iar, but the thousands of prisoners, taken in battle were employed in raising those enormous mounds or elevated platforms on which the palaces of Nineveh, Nimroud, Khorsabad, Susa, and Persepolis were constructed, a small space being reserved for those temple observatories built in receding coloured stages, from which the astrologer-priest could consult the signs of the heavens.

The architecture of the Greeks reflects each stage of their history with remarkable accuracy, rising to its fully developed artistic height after the battles of Marathon and Salamis.

The buildings of the Pelasgic and Mycenaean indicate the ruggedness and serverity of the earlier inhabitants; but the Hellenic period introduces us to the most refined architecture the world has ever seen, which has been a pattern to, and has exerted so great an influence on, all subsequent art, that Greece must be held to be the source of the best artistic inspiration, which corresponds with her literary pre-eminence. In a climate remarkable for the clearness of its atmosphere, and in a country rich with marble, the most beautiful and monumental of all building materials, the Greeks evolved a type of architecture whose purity of outline and perfection of proportion has never been equalled. Their religion engendered a desire to erect stately temples and their national games and festivals gave an opportunity for the development of music, literature, and the drama, and inspired that emulation in manly sports and contests which distinguished the race. The national exultation of the Greeks when they finally defeated the Persians was accountable for the fact that all the more important temples now found in Greece were built in the fifty years which succeeded the overthrow of their enemies.

The most famous and the most perfect of these were erected during the rule of the great Athenian, Pericles (B.C. 444-429), which marked the climax of Athenian prosperity, art, and culture. This is reflected in those world-famous structures on the Athenian Acropolis, in which the most delicate optical refinements were introduced, and the most perfect sculpture known in the history of mankind was employed in their adornment.

The principal Greek buildings are the temples, and these are in direct contrast to those of Egypt, being public as opposed to royal monuments. Instead of the high enclosed wall and mysterious halls of the priest-ridden Egyptians, we find the small naos for the statue of the god, while on the exteror is lavished all the beauty of column, entablature, sculptured metope, frieze, and pediment, brightly treated in many colours.

The open-air theatres, in which the plays of the great Athenian dramatists were produced, the palaestra, with their lecture recesses, and the stadia are the practical and material evidences of the Greek love for the drama, philosophy, and outdoor sports.

The power of Macedonia was made paramount by Philip and his son Alexander the Great, and the latter in B.C. 334 set out on his great expedition for subduing Egypt, Persia, and Northern India. His influence on these countries and the dissemination of Hellenic civilisation in Asia are manifest in the architecture of Northern India, which is specially remarkable for its purity and for the influence it exerted on subsequent Saracenic art introduced there a thousand years later. When in B.C. 146 Greece became a Roman province, here architecture as a national style died with her nationality, although, like her civilisation, it continued for a long period to exert its influence upon Roman art.

The architecture of Rome then succeeded that of Greece, as did also her civilisation, and we pass from a simple, trabeated style to a complex type of arch, vault, and beam. The architecture of the Romans was largely influenced by the older Etruscan art, so that in Roman architecture we find the blending of the beam of the Greeks with the arch of the Etruscans. The character and history of the Romans is well shown in the variety and monumental nature of their buildings.

Temples were still erected, but of a different type from those of the Greeks, and were used as much for the protection of accumulated Greek spoils as for worship. In addition to the stately temples, furnished and adorned with the finest sculptures, we now find buildings of more complex planning and construction designed for many purposes. Stately palaces laid out on an immense scale tell us of the magnificence and luxury of the Roman court, while the superbly decorated private houses of Rome and Pompeii indicate the important character of the "patria potestas" —the basis of Roman law. The Roman love of justice is also materialised in their numerous basilicas or courts of law, while their theatres indicate quite a different idea of the drama and its representation from that of the Greeks. The amphitheatres and the circuses were the natural results of that love for brutal sports between men and wild beasts, and that coarseness, yet boldness of character, which enabled the Romans to bring the whole of the then known world under their domination; while the great thermae of the latter empire are evidences of the indolence and love of luxury which led to the final decline and fall of the empire. The conquering legionaries of Rome were utilised during the periods of peace as unskilled workmen in the formation of the great Roman roads, and these, along with the triumphal arches which are to be met with in various parts of Europe, form the permanent expression of Roman power and domination.

Further, by the universal use of the newly-invented material, concrete, and by the employment of the arch, vault, and dome, the original architecture of imperial Rome was reproduced in all parts of the empire. Thus the Roman style of building, ever the faithful mirror of Roman civilisation, became the foundation of all later European architecture.

The most magnificent period of Roman art synchronised with the Augustan age of literature, and it was the boast of Augustus that he had found Rome of brick, but would leave it of marble.

The decline of the Roman Empire, which was accelerated by the life of ease and luxury led by the Romans, is amply illustrated in their later architecture, which is often over-decorated and coarse in detail.

But a climax was at hand, and with the fall of the Roman Empire came the end of a great chapter in architecture and civilisation.

The new force in the world's history was Christianity, and, as all roads led to Rome, the very highways which formed the connecting links of the empire could be used for the propagation of the new faith. The new religion resulted in the construction of over thirty churches of the basilican type in Rome alone. This form of building was preferred by the early Christians for reasons too numerous even to touch upon here. These churches, by the retention of pagan Roman architectural features and arrangements, modified by degrees to meet the requirements of the new religion, clearly indicate that the new faith was slow in developing. An impetus was given to architecture by the transference of the capital from Rome to Byzantine (Constantinople), resulting in a new style known as Byzantine. Away from the influence of "Old Rome" the architecture of "New Rome" developed features which were undoubtedly of Eastern origin, although carried out by Greek craftsmen, and of these the dome on pendentives was the most important. This style reached its culmination in St. Sophia, Constantinople, and became the official architecture of the Eastern or Greek Church, which, like the orthodox faith it represents, has remained strangely conservative even to the present time.

Not so the architectural development in Western Europe, outside Italy. Here during the Dark Ages architecture was dormant, and from the break-up of the Western Empire till the time of Charlemagne, in the eight century, building was at a standstill. Charlemagne, however, in a great measure restored the arts to Western Europe, and his magnificent tomb-house at Aix-la-Chapelle is one of the finest examples of the period. The rise and cohesion of the Gothic nations was a matter of time, but the changes and progress of the Roman Church throughout the mediaeval period were faithfully expressed in the great monastic establishments erected.

Till the Western European nations could get out of leading-strings they looked to Rome, and durthe tenth, eleventh, and twelfth centuries, cathedrals and churches were erected throughout Europe, bearing distinct resemblance to the later Roman architecture, although carried out by the new nations which had been spreading over Europe from the north and east, and the style is known to us as Romanesque. This is exceedingly interesting, for it shows how far-reaching was the Roman civilisation. The Romans themselves, however, were eventually driven back by the Goths into their native country, and as time went on the nations of Western Europe developed their own styles. The formation of European States, and the religious enthusiasm of the period manifested in the Crusades, were most important factors in giving the necessary impetus to the introduction of that type of architecture known as Gothic.

The architecture of the Middle Ages was an evolution from the Romanesque style, and was an architecture of stone in small pieces, corresponding with the disintegrated state of Europe, and symbolising, as it were, the breaking up of the Roman Empire into small independent states.

The Gothic masons heaped up their small stones in towers, that rose on open archways, through the lofty roofs which covered the nave and transepts, and, pointing heavenward, tapered away in lofty spires, embroidered in a fretwork of elaborate tracery.

The prominence of the clergy, consequent upon their learning and the wealth and power of the monastic orders, caused the Church to be the one great avenue for advancement in the Middle Ages, and this, aided by the religious fervour of the times, was responsible for the great outburst of church building at the commencement of the thirteenth century. Hence the pointed-arch architecture of the thirteenth, fourteenth, and fifteenth centuries in Europe was in great measure ecclesiastical, and was used in the construction of an immense number of important cathedrals, to say nothing of innumerable parish churches.

Throughout this period, although militarism was an important factor in the social regime, the builder's art caused the employment of a large section of the community, while the Church was the chief profession. The historic development is shown very clearly in these Gothic churches. The priest is exemplified in the plain and somewhat ascetic character of the Early English, or thirteenth-century style, the noble in the more florid treatment of the Decorated period, and the merchant in the matter-of-fact yet occasionally showy appearance of the Perpendicular, or fifteenth-century style, characteristics which were surprisingly similar in all the countries of Europe.

Gothic cathedrals are very faithful exponents of mediaeval civilisation and Church history. Their place in the national life was all-important, for, in the absence of printed matter, they formed the history-books of the period, the beautiful sculptures and stained-glass windows reflecting incidents of Bible history from the Creation to the Redemption. They took the place now occupied by schools, free libraries, museums, and picture-galleries. Here also is to be found the grand chronicle of secular history, in which kings and nobles, knights and commoners are represented. The worship of relics, of local saints (as St. Thomas at Canterbury), the periodical pilgrimages, the introduction of Mariolatry, the necessity of aisles for processional purposes, the introtuction of chantry chapels for Masses for the dead, and other changes of ritual, had their influence on church plans and their ornamentation The great size and beauty of the mediaeval cathedrals was in a large measure due to the concentration of the artistic energy of the period on these works, instead of its being employed, as nowadays, on a variety of buildings.

Militarism, on the other hand, is expressed in the fortified and frowning castles of the nobles, which form an eloquent though silent testimony to the feudal system of the mediaeval period, as also to the comparatively unsettled condition of Europe.

Gothic architecture closed with the mediaeval period at the commencement of the fifteenth century in Italy, and of the sixteenth century in the rest of Europe. It had, like the mediaeval civilisation which accompanied it, run its course, and was overturned by a succession of historical events which in the succeeding centuries were to alter the face of Europe.

We can, by a retrospective view, see the influences which slowly paved the way for that upheaval in literature and art known to us as the "Renaissance," which, aided by enthusiasm for the newly-discovered classical buildings which had been buried for centuries, caused a desire for the revival of old Roman architectural forms and ornamentation.

As may be understood, the return to classic ideals naturally commenced in Italy, where the Gothic art had never been adopted to such an extent as in Northern Europe. The first town to be affected by the revival was Florence, due in large measure to its commercial prosperity and the enlightenment of the Medici family. The way was paved by the writings of Dante, Petrarch, Boccaccio, and, later still by Erasmus, who helped to crystallise the revolt against mediaeval thought and art. This revolt was also aided by the newly-discovered MSS. of Greek and Latin authors, of which the books of architecture by Vitruvius, who lived in the time of Augustus, were most important. Other facts, such as the invention of printing, which aided the spirit of inquiry and the diffusion of thought; the discovery of gunpowder, which changed the whole method of warfare; and the mariner's compass, which led to the discovery of the New World, were important factors in the propagation of that freedom of thought and action characteristic of the period.

The influx of Greek scholars and artists to Europe, consequent upon the capture of Constantinople by the Turks, in 1453, had an important influence in an age ripe for an intellectual change, and in which it became, for a time, the fashion to talk in Latin—an evidence of the close connection between the architecture and literature of this period.

All these influences might have been futile if it had not been for the work and influence of such artists as Della Robbia, Ghiberti, Brunelleschi, Alberti, Donatello, Bramante, Peruzzi, Sangallo, Raphael, Vignola, Michael Angelo, Sansovino, the Lombardi, Palladio, and a host of others. Vasari, in his lives of different architects and artists, shows the personal influence exercised by them on the arts and crafts of the Renaissance period. The character of the architecture, as represented in the new churches and palaces. faithfully reflects all these great changes in favour of the ancient Roman traditions by the banishment of the Gothic pointed arch, intersecting vault and vertical features, and the employment in a modified form of the Roman orders of architecture, applied to buildings covered by the Roman circular dome supported on a square base by means of the Byzantine pendentive.

This wave of Roman rejuvenation was felt in France, England, the Netherlands, Germany, and Spain, though the effect in each country was delayed by the distance from the fountain-head, and was influenced by various internal social and political events.

In France, rich with splendid piles of Gothic architecture, the new style did not entirely displace the old, but was grafted upon it in a most delightful and picturesque fashion. It was mainly utilised in the palaces of kings, the town halls and large country houses of the notability, because the immense number of churches built in the Middle Ages long sufficed for the spiritual needs of the people. We cannot accurately trace the influence of Italy upon France unless due notice is taken of the invasion of the former country by Charles VIII and Francis I., in vindication of their claims to the thrones of Naples and Milan, because their return to France marks the distribution over Europe of Italian artists and workmen such as Leonardo da Vinci, Benvenuto Cellini, Serlio, Vignola, Rosa Primaticcio, and others who followed in their train.

The Renaissance in England, which, as in Germany, synchronised with the Reformation, was brought about by many historical events, such as the meeting of Henry VIII with the French King on the Field of the Cloth of Gold, and the consequent introduction into England of Italian and French architects. Again, the suppression of monasteries (1536-40), caused the diffusion of vast revenues, which were distributed amongst the courtiers of Henry VIII, and this led to the erection of residences for the new favourites, which displaced the obsolete castles of the old nobility of whom a large proportion had been killed in the Wars of the Roses. A further result was the building and endowment of grammar schools and colleges, which played an important part in the movement, and paved the way for the great literary activity of the Elizabethan area, rendered famous by the writings of Spenser, Shakespeare, Burleigh, and Sir Phillip Sydney.

The Elizabethan period, when church-building was at a standstill, is notable for the influx of Flemish and German workmen and the immigration of Huguenot craftsmen, due to the Massacre of St. Bartholomew in France, in 1572, and is remarkable for its numerous domestic mansions, the design of which was influenced very largely by this immigration. The newly introduced classical details were used with such caution and delayed by such conservatism as we should expect of the English character, and the buildings often retained many special features, such as the great hall, long gallery, broad staircase, and large mullioned windows, of the previous periods. These mansions are generally found in a perfect setting formed by a beautiful formal garden, indicative of the Englishman's love of country life, and they are designed on generous lines, illustrating the scale of hospitality which obtained in the spacious times of Queen Elizabeth.

The later Renaissance period felt more strongly the classical influence owing to the careful study of Italian examples by Inigo Jones, and to the works of Sir Christopher Wren in the latter half of the seventeenth century.

Owing to the Great Fire of London, when many places of worship were destroyed, numerous churches were erected in the city for the Protestant religion, which gave prominence to preaching, and demanded galleries and congregational planning in the place of the long-drawn processional aisles of the mediaeval period.

In North-West Europe, the Reformation accompanied, or rather preceded, a fresh building era, but with the exception of the period of Charles V. the existence of a number of independent petty states occasionally at war, each having its own government and capital, prevented any such national effort as was possible in France. On the other hand, ecclesiastical, commercial, and municipal buildings tell of the flourishing condition of some of the principal towns of this part of Europe.

In Spain, the Renaissance followed the fall of Granada, in 1492, and expulsion of the Moors, when the country became consolidated under Ferdinand and Isabella; but the new style was much influenced by the Moorish craftsmen, who gave a special ornamental character of richness. intricacy, and refinement to the architecture of the country.

Until the nineteenth century, which was the era of revivals of all styles, architecture was generally traditional. These revivals were brought about by numerous causes, among which the facility of travel, the increase of illustrated books and the break-up of traditional schools of craftsmen were important. Nevertheless, architecture still continues to reflect the thought of the day, the needs and aspirations of the people, and is an index of the social forces at work. This is shown in the erection of numerous types of buildings, such as museums, board schools, public libraries, public markets, hospitals, swimming baths, drill halls, colleges, picture and art galleries, and scientific and benevolent institutions to meet modern requirements.

(To be continued.)

NOTE:—This article is reprinted from the Transactions of the Seventh International Congress of Architects, held under the auspices of the R.I.B.A., London, 1906.

THE NEW "CATHEDRAL OF LEARNING"
NOW BEING ERECTED AT PITTSBURGH, U.S.A.

EARLY in October ground will be broken for the 52-story "Cathedral of Learning" for the University of Pittsburgh, says the *Pacific Coast Architect.* Three years will see the completion of this unique Gothic structure, 260 by 360 feet at its base, soaring to a height of 680 feet, high above the thousand Pittsburgh factories and hills.

The structure, which will serve as the central building for the University, will accommodate 12,000 students. It will house all of the departments of the University except those of medicine and dentistry. It will provide class rooms, libraries, laboratories, shops and recreational centres for students and faculty.

The "Cathedral of Learning" is the culmination of Chancellor John G. Bowman's vision of creating a great urban University which will reflect the virile spirit of achivement of Pittsburgh. The up-rising masses of the building express forcibly the striving and the hope that should be a University's. At the same time, the memorial classroom, laboratories, libraries and tablets will keep vivid the lives of those who have made Pittsburgh more than a centre of wealth and industry. To execute this plan of Chancellor Bowman, Mr. Charles Z. Klauder, an outstanding student of Gothic collegiate architecture in this country, was chosen.

A University Citizens' Committee, broadly representative of the district's interests, assumed the responsibility of raising the $10,000,000 necessary to build the "Cathedral of Learning." In an intensive solicitation for contributions to the University's building fund, extending over a period of two months, more than $7,000,000 has been raised, practically entirely in the Pittsburgh district.

This sum represents more than 8,000 separate subscriptions from the industrial corporations, mercantile establishments, financial institutions, and individuals. No comparable sum has ever been raised in the community for any other purposes through voluntary solicitation except for the late war loans. Practically every interest in the district has supported the enterprise. Alumni raised $1,000,000. Students and faculty members pledged nearly $400,000. Ninety-three thousand Pittsburgh school children contributed ten cents each of money earned by themselves. Several million dollars remain yet to be raised. This task will be accomplished and entirely completed by fall.

The cost of high construction per cubic foot is somewhat higher than for low structures. This greater cost is largely offset by a greater percentage of effective area obtainable in the high building. High construction offers better ventilation, better light, less noise and less dust. The cost of heat, upkeep and janatorial service favors high construction. The saving in land for building space has been estimated at approximately $2,000,000.

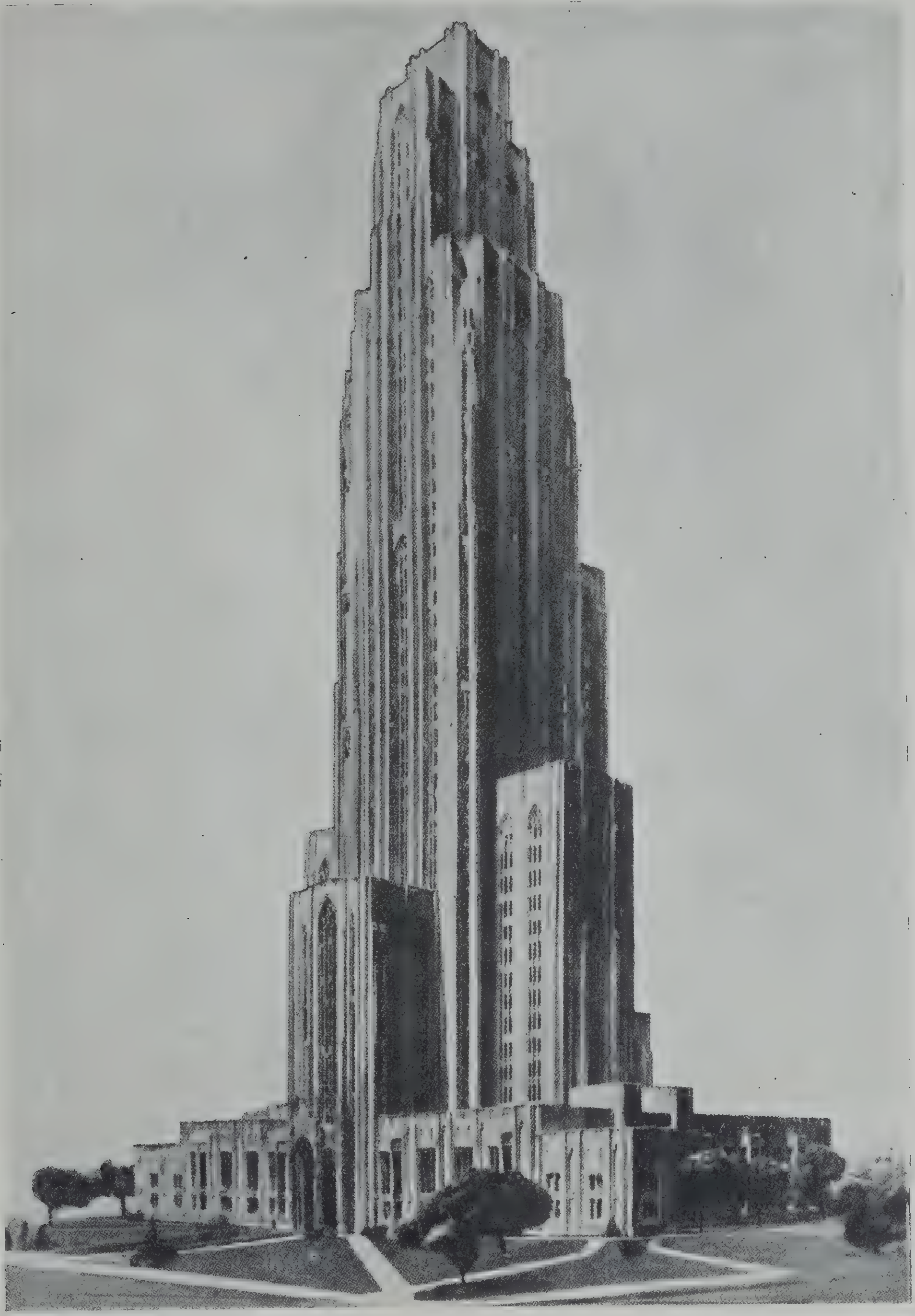
Tenny & Ohmes, of New York, and Stone & Webster, of Boston, two of the country's outstanding engineering firms, have declared the structure entirely practicable and without any unusual problems of construction.

Educationally, the "Cathedral of Learning" is to be as unique, as significant, as it is architecturally. There is not to be a single barren, ugly recitation room. Rows of chairs are to disappear. It is planned to make each room beautiful. They are to resemble private studios. The chairs are not to be alike. The best chair is to be occupied by the teacher, not by virtue of his position but by virtue of his integrity, his character, his intelligence and the high motive of his life. Good pictures are to hang upon the walls.

Of all the means at the disposal of an architect by which to convey active emotions, those of mass and proportion are most effective. In fact, any tremendous or powerful rush of feeling expressed through architecture is much dependent upon them. A building, therefore, let us say four stories high, is incapable of supreme expression of power in action because it cannot offer this free sweep to the imagination.

The University desires, now, as already stated, to interpret by its proposed building the active emotions of courage, daring, achievement, together with spiritual aspiration. How can this be done? First, the use of mass and proportion is imperative. This use requires height. Mere size will not "ennoble a mean design, yet every increase of magnitude will bestown upon it a certain degree of nobleness," says Ruskin.

"No architect in all history," says Mr. Klauder, when he first undertook the design, "was ever before given such an opportunity. The use of mass and proportion is unlimited; ornamentation is scarcely needed at all; and the whole structure is unhampered by its surroundings."



THE "CATHEDRAL OF LEARNING,"
UNIVERSITY OF PITTSBURGH, PENNSYLVANIA,
CHARLES Z. KLAUDER, ARCHITECT.

ENGINEERING SECTION
CONDUCTED BY "BUTTRESS"

THE ELECTRIC PASSENGER ELEVATOR

ESTIMATING SERVICE REQUIREMENTS

1. HORIZONTAL AND VERTICAL TRANSPORTATION.—Modern electric passenger lift practice in large buildings will, if analysed, be seen of resemble, in miniature, a suburban surface railway, a tube railway, or a tramway serving two or more stations or stopping places, the main differences being that the direction of travel is in a vertical instead of a horizontal direction, the stations or floors are nearer together, the service is, or should be better (i.e. the time interval between the departure of successive cars is shorter), and the number of passengers entering and leaving the cars at intermediate stations or floors is usually smaller. If the number of cars is insufficient to carry the number or passengers who desire to travel, or the cars are large and carry a considerable number of passengers, but have in consequence to stop at each floor on the up trip, and at each floor on the down trip, it is apparent that in the first case a considerable number of people will use the stairs rather than wait if their destination is not far up; and, in the second case, that the service will be so bad that many people will be kept waiting for an unreasonable length of time, or will become impatient and will also walk. In either case, it is obvious that there will be reasonable cause for complaints, and tenants on the higher floors will either seek accommodation elsewhere, which is more conveniently situated, as regards time from the street, or demand lower rentals, due to the inconvenience. When the cars carry the number of people that arrive at, or depart from, the building in a given time and distribute them on the various floors or bring them to the street level, then the service may be considered 100 per cent. of that required. The limiting point in the carrying capacity of any passenger lift is reached when certain combinations of passengers carried and floors to and from which they are carried occur.

2. OPERATING CYCLE.—The daily or hourly work of an electric passenger lift consists of a definite cycle of operations many times repeated, the complete cycle being termed "a round trip." The number of round trips per hour per car obviously depends on the time required for one trip, and this again depends on a number of factors.

The cycle of operations for a two-floor lift starting from rest at the ground floor and carrying passengers in one direction only may be roughly classified as follows:—

(a) Passengers enter the car at the ground floor;
(b) Landing doors closed;
(c) Car gate closed;
(d) Car accelerates from rest to maximum load speed;
(e) Car runs at maximum load speed;
(f) Car approaches first stop and slows down from maximum load speed to rest at top floor;
(g) Car gate opened;
(h) Landing doors opened;
(i) Passengers leave car;
(j) Landing doors closed;
(k) Car gate closed;
(l) Car accelerates from rest to maximum load speed;
(m) Car travels at maximum load speed in downward direction;
(n) Car approaches ground floor and slows down from maximum load speed to rest at the ground floor;
(o) Car gate opened;
(p) Landing door opened.

3. CAR SPEEDS.—In determining the speed of passenger lift cars, due consideration should be paid to the size of the car, the total height of travel, the landings served, the method of operating the cars, i.e., express or local, the method of control to be employed, the cost of electrical energy, and the amount available for the motor since high car speeds involve powerful and expensive motors and increased power bills.

The following data may be regarded as representative of modern American practice for office and similar buildings equipped with direct-current motors:—

TABLE I.
Car Speeds.

Total Travel (ft.)	Max. Car Speed (ft. min.)
0-50	50-300
50-75	300-350
75-100	350-400
100-150	400-500
150 up	400-500

TABLE II.
Car Speeds.

Type of Building.	Max. Car Speed (ft. min.)
Flats	200 ft. min.
Department Stores	350 ft. min.
Office Buildings—	
Up to 10 floors	200-400 ft. min.
10 to 15 floors	400 ft. min.
Government Buildings—	
30 to 40 ft.	200 ft. min.
45 to 70 ft.	250 ft. min.
75 and over	300 ft. min.

For express service, *i.e.*, a non-stop run of 80 ft., a car speed of 550 to 600 ft. per minute is commonly employed.

Single speed controllers are, as a rule, fitted to cars travelling at all speeds up to 200 ft. per minute, two-speed controllers up to 300 ft. per minute, and three-speed controllers above that speed. It will therefore be noted that not only do high-speed cars involve more expensive motors but also that the control gear necessarily becomes more elaborate.

For cars fitted with the single speed type of automatic push button controller only, a speed of 160 ft. per minute is usually regarded as the maximum.

It should be noted that high-speed cars used on local service are liable to be costly to operate since they spend nearly as much time in accellerating and retarding as they do in running at full speed, and each time the car starts the motor armature, car, counterweights, cables, etc., must be accelerated from rest. Few methods of control return the kinetic energy stored in the moving parts (which for a given mass is proportional to the square of the velocity) to the line, it being almost invariably dissipated in the form of heat, either in the resistance coils of the dynamic brake or in the shoes of the magnetic brake.

4. TIME REQUIRED FOR THE ROUND TRIP AND NUMBER OF TRIPS PER HOUR.—Many people have apparently held the view hitherto that a high load speed meant quick service under all conditions, but consideration of the sixteen factors, constituting the cycle of operations, scheduled in paragraph 2, will indicate quite clearly that this is not necessarily the case. In fact, if the car is large and the stops very near together the operations of acceleration and retardation of speed will cover the distance travelled, and the car may seldom actually travel at maximum speed. Similarly, an indefinite increase in the passenger capacity of the car may in certain circumstances actually reduce the total number of passengers carried per hour.

Observations have been made in many hundreds of installations, and the following average figures have been obtained which enable time schedules to be calculated that will give reasonable accuracy in practice:

(a) *Time required to open and close landing doors.*—This depends upon the strength of the attendant, the accessibility of the door latch, ease of motion and width of doors; average 1½ to 3 secs.

(b) *Time required to open and close car gate.*—This also depends on factors as above, and averages 1½ to 3 secs.

(c) *Time required for passengers to enter and leave car.*—This depends upon age and experience of passengers, shape and size of car, number of people in car, etc. This averages 1¼ to 6 secs., but is usually taken as 2 secs. for the combined operation.

(d) *Time required for passengers to enter or leave car at intermediate landing.*—Including doors and gates this is usually taken as 6 secs.

(e) *Landing Stops.*—These are usually assumed to be 0.4 of the floors served in each direction. Thus, in a five-floor building there would be two stops on the up and two stops on the down journey, or 5 x 5 - 10 and 10 x 0.4 - 4 stops.

(f) *Mean Speed.*—This is frequently assumed to be 80 per cent of maximum speed, but of course, this depends upon the value of the maximum speed and the distance apart of the stops. Thus, a car travelling from floor to roof at a speed of 10 ft. per sec. would, if the run were to be made up of a series of stops and starts 16 ft. apart, attain a mean speed of only about 6 ft. per sec., *i.e.*, 60 per cent of the maximum speed. The time required for acceleration and for retardation frequently averages from 3 to 6 secs., depending on the load speed.

Example.—Assume a ten-floor building, *i.e.*, four passengers up and four down; maximum speed, 300 ft. per min., height - 120 ft. Then time required for round trip is:—

(a) Four passengers enter and four leave at the ground floor at 2 secs. each	8 secs.
(b) Close and open landing doors at ground floor, at 2 secs. each	4 secs.
(c) Close and open car gate, etc.	4 secs.
(d) Eight landing stops, at 6 secs. (four on up and four on down journey)	48 secs.
(e) Travel time for 240 ft. at 80 per cent of 300 ft.	60 secs.
Total Time ..	124 secs.

Trip time - 2 mins. 4 secs., and trips per hour - 29. Passengers handled per hour:—Up, 116; Down, 116. Total 232.

It will be observed that, if the basis of calculations is that shown above, when tenants arrive in the morning the car can call at 80 per cent of the floors on the upward journey and make a non-stop journey down without materially affecting the time schedule. Similarly, in the evening, the car will make a non-stop trip on the upward journey, and will call at 80 per cent. of the floors on the down trip. These figures only represent average conditions since the human element of the passengers enters largely into the calculation.

Another method of figuring the time required for the trip assumes that 27½ secs. should be allowed for accelerating and retarding the car and loading and unloading at the ground floor, and that 7 to 8 secs. will be required for accelerating and retarding the car and loading and unloading at each landing stop above the ground floor. The number of stops per car mile is based on the assumption that in office buildings up to eight stories it will average 150 to 200, and above that 125 to 175 for local service. For express service it is found to average from 50 to 150 stops, depending upon whether service is given to several upper floors or only to a restaurant or club on one floor. The round time trip of a lift should not exceed, as a general rule, 2½ mins., but will be found to vary between 1½ to 3 mins., depending on height of building, speed, etc.

Time schedules are materially affected by safety appliances, such as door and gate locks, car gates, etc., as the time for loading and unloading is inevitably increased. It follows, therefore, that the extension of safety appliances tends to increase the number of cars installed. This is unfortunate, but the safety consideration is the all-important one.

5. TRAFFIC ESTIMATES AND NUMBER OF CARS REQUIRED.—Lift traffic, unlike bus, tube, tramway and suburban railway traffic cannot be almost indefinitely expanded to meet rush hours by adding additional cars, as it is only possible to run one car in one shaft, or between one set of guide rails. Fortunately for lift engineers, abnormal rush traffic is not frequently encountered and normal requirements which recur daily can be calculated with a fairly

close degree of accuracy. The work of the lift is the carriage of passengers, and the passengers are either tenants or visitors. The number of visitors per hour is irregular, and they are less insistent upon immediate transport than the tenants. Therefore, an estimate of probable tenancy provides in the majority of cases the means of ascertaining the maximum rate of travel which takes place at the time of their arrival and departure.

Generally speaking, the following figures will provide a very fair basis for calculating the maximum traffic to be handled in any given class of building:—

TABLE III.

Occupied Floor Area.

Type of Building.	Sq. ft. of Occupied Floor Area per Occupant.
Cinema Theatres from	6 sq. ft.
Cafes, and restaurants from	12 sq. ft.
Stockbrokers, engineers, etc., employing clerks, draghtsmen, etc.	75-100 sq. ft.
Banks	120 ft. ft.
Family hotel	200 sq. ft.
Modern hotel	250 sq. ft.
Flats	300 sq. ft.

Frequently the occupied area of a modern office building will be found to average 60 per cent of the gross area.

Other factors which will influence the hourly traffic of the lifts either in one or both directions are: Restaurant on one floor used by tenants; club or exclusive restaurant which the tenants' employees do not patronise; toilet rooms grouped on a single floor; basement and sub-basement floors which do not form part of the scheduled time-table; residential flats on upper floors, etc.

Example.—Take an office building of ten floors above the ground standing on a site 100 ft. by 50 ft. - 5000 sq. ft. per floor, or a total of 50,000 sq. ft. of floor space, and allow 100 sq. ft. per tenant, *i.e.,* 500 tenants. The majority will probably arrive and leave within a period of 30 mins., and the traffic to be handled is at the rate of 1000 per hour. Assuming the lift referred to in the previous paragraph be installed as a unit, this will handle 232 passengers per hour, and, therefore, a minimum of four lifts are indicated, but preferably five should be installed to admit of one being laid off for repairs without seriously affecting the time schedule. If four lifts are installed, the time schedule (*i.e.,* the period of time between the dispatch of cars) will be 31 secs., and if five cars are installed the time schedule will be 25 secs. approximately. This would be considered quite satisfactory, as experience indicates that business people object to waiting more than 30 secs. Another factor which must be taken into account in deciding the number of lifts to be installed in high buildings, is that of extricating the occupants from the upper floors within a reasonable space of time in the event of fire.

6. GROUPING OF CARS.—Experience shows that maximum efficiency is attained by grouping the lifts together in one part of the building near the main entrance so that the operators may be placed under the supervision of a "starter" or dispatcher. Elevator halls are a feature of all modern American office and hotel buildings, locals being grouped on one side and expresses on the other. At least one car should be arranged with back gearing to lift heavy safes which ordinarily will not exceed 6000 lbs.

(*Excerpt from "Electric Lift Equipment for Modern Buildings," by Ronald Grierson*).

REINFORCED CONCRETE AND FIRE RESISTANCE

The assessment of the fire risks appertaining to various methods of construction must necessarily be based largely on experience, and as such experience in the large range that is desirable is generally not obtained for several years after any new constructional system has been introduced, it follows that there is a tendency for the ideas on which fire risks are assessed to be somewhat out of date. Under these circumstances, the tests of the fire resistance of various systems of construction carried out by the British Fire Prevention Committee, the United States Bureau of Standards and others, are of considerable importance and need to be strongly emphasised if the results of such tests show that current ideas of fire risk surveyors are not in line with reasonable deductions from the experiments.

British fire insurance offices appear to have adopted a system of rebates in premiums to coincide with certain reductions in the fire risk, the allowances ranging from 10 per cent. to 40 per cent. under four standards, but so far as the building construction is concerned, the allowance is the same so long as structural metal is protected by bricks, terra-cotta, concrete, etc., practically the only distinction being between an unprotected steel structure—for which no rebate is made—and protected steel structures, which include reinforced concrete. The chief considerations which govern the inclusion of a building in any one of the four standards mentioned—apart, of course, from the nature of the contents, which is of prime importance—are dimensions, openings, flues, etc., and material of construction is regarded as of lesser importance.

The most recent experimental evidence available is to be seen in a publication of the United States Bureau of Standards (Technologic Paper No. 184), where are given results of fire tests of 106 building columns conducted at the Underwriters' Laboratory in conjunction with Fire Insurance Companies and Fire Underwriters. Among the four classes of columns tested were (1) reinforced concrete and (2) steel protected by 2in. or 4in. of concrete, hollow tile, brick, etc., and the results should accordingly refute or confirm the belief that fire insurance surveyors would be justified in allowing a rebate in premium for buildings of class (1) compared with those of class (2).

The reinforced concrete columns tested were 12ft. 8in. long by 16in. square or 17in. diameter, the concrete being 1 : 2 : 4 and containing various aggregates. The reinforcement was of the usual types and the columns were designed for a working load of 100,000 lb. load and the temperature was regulated to reach 1,700 deg. F. at one hour; 2,000 deg. F. at 4 hours; and 2,300 deg. F. at 8 hours.

The results demonstrate that reinforced concrete columns were the most fire resistant, and showed a marked superiority in this respect to protected steel columns, as will be seen from the following tabulation:

	Time at which failure occurred.				
	hrs.	mins.		hrs.	mins.
Reinforced Concrete	7	23	to	8	40
Steel with brick protection .	1	40	to	7	13
Steel with hollow tile protection		50	to	4	42
Steel with concrete protection	1	47	to	8	24

The superiority of concrete as a fire resistant is exemplified not only by the reinforced columns, but also by the protected columns where concrete gives better results than other protecting materials. The paper in question gives many tests of other columns such as timber, unprotected steel, cast iron, etc., and the results confirm the wisdom of placing such constructional materials in an entirely different class from concrete and protected steel.

A further and most valuable piece of evidence upon the subject is given by the British Fire Prevention Committee's "Red Book," No. 207, showing the results of the investigation following the fire at the Edison Phonograph Works at New Jersey, U.S.A., where a number of large reinforced concrete buildings were involved. In this publication, the following extract is given from a report upon the fire by the Associated Factory Mutual Fire Insurance Companies of America—a body which represents the interests of the building owner and quite impartial as to constructional materials.

"This fire shows that a reinforced concrete building is a fairly good furnace or stove, for these buildings withstood the complete burning out of a large amount of combustible contents with only such damage to the buildings themselves as can be repaired at reasonable cost."

The severity of the fire is demonstrated by the fact that fused iron, copper, brass and glass were found in the concrete buildings after the fire, and it was considered that temperatures in excess of 2,500 deg. F were reached. The following extracts from the "Red Book" may be quoted:—

"In general, under ordinary conditions of fire exposure, the concrete, while cracked, was not damaged to any great extent.

"The end walls in the three upper floors were of reinforced concrete 8in. thick while this was in the hottest part of the fire, these walls were practically undamaged, and are an admirable demonstration of the value of concrete walls as a fire barrier.

"In the greatest portion of these buildings the concrete remained firm and hard and intact after this severe heat treatment.

"While the surface indications were that the strength of the floor construction had been severely damaged by the fire, the factor of safety assumed in the design was sufficient to meet the unusual fire test, and the floors before repairs had sufficient strength to carry, for a time at least, the designed live load, although the use of the building and the effect of moving machinery might have later reduced the strength if repairs had not been made.

"The salvage in machinery in the reinforced concrete buildings is at least 94 per cent., of the buildings 87 per cent., and the cost for the restoration of the buildings from 10 to 15 per cent."

THE CRACKING OF CONCRETE

The appearance of concrete surfaces is often somewhat disfigured by a number of small cracks, known as crazing or haircracks, this name being given because of their fineness, resembling mere lines the width of a hair on the surface. Hair-cracks are entirely on the surface, and do not indicate weakness in the concrete. They are frequently caused through an insufficient proportion of sand in the mortar and are more apparent on a cast or finely trowelled face than on a rough floated surface, that is to say, upon a surface that has been smoothed over finely with a metal trowel than upon a surface that has only been rubbed over with a wooden or cork float. The crazing of the surface in this way is due to the cement skin which is brought to the surface by excessive trowelling. Cast concrete which has been mixed fairly wet is more apt to show hair-cracks than a dry mixture, through a portion of the flour or very finest particles of the cement being carried to the surfaces by the action of excess moisture, so forming a richer mortar on the surfaces than is obtained in the body of the concrete. The coating of practically neat cement that is obtained in these ways exhibits the same characteristics as neat cement mortar, which is much more liable to crazing than mortar containing a proportion of sand. Neat cement if made into test pats for laboratory purposes, and exposed to a current of air, will sometimes exhibit these hair-cracks, and should, therefore, be protected in a moist closet or by a damp cloth during setting. If the concrete be exposed to the sun it will craze if it has a very fine finish, the cause being unequal expansion between the surface and the body of the concrete under sudden changes in temperature; the sun, for instance, will warm the blocks of concrete considerably and then suddenly when the sun is hidden and a cold wind is blowing, or possibly at nightfall when there is a sudden drop in temperature, the interior remains for a time unaffected. Naturally the surface must crack under such conditions, but the crazing is only in the neat cement finish, and does not penetrate to any depth—only the depth, practically, of a hair.

Hair cracks can be prevented by removing the thin cement skin from the face of the work; this may be done either (1) by brushing the surface with a stiff steel wire brush (2) by scrubbing the surface with a block of concrete and wet sand (3) by using a sand blast, or (4) by washing with a 20 per cent.

solution of hydrochloric acid (known commonly as "Spirits of salts"). The brushing or scrubbing, although it is of considerable assistance, requires to be supplemented by keeping the surface thoroughly and continuously wet for as long as possible. This is one of the troubles in laying cement pavements in situations where traffic is to pass over in a short period; such pavements may exhibit a great deal of contraction after hardening in air, as it is difficult to keep the surface wet. The hair-crack trouble, however, does not matter in connection with concrete pavements, because the cement skin is soon removed by wear.

The surface in many cases can be kept damp by putting a layer of sand, sawdust or straw over it, or by hanging cloths over vertical surfaces, the covering being kept well wetted.

Cracks larger than those above referred to are caused by expansion and contraction, and in long walls or large surfaces of concrete they should be prevented, either by providing joints or by reinforcing the concrete with steel rods or wire. A joint may easily be formed by placing a board between the two sections of the concrete. This board may be greased and withdrawn just as the concrete is setting and the cavity filled with sand. Another method is to insert two or more thicknesses of tarred paper between the sections of the work, this being left in the concrete. In plain concrete it is advisable for joints to be not further apart from 6 ft. in paving, 10 ft. in curtain walls, 15 to 20 ft. in exposed retaining walls, and 50 ft. in unexposed retaining walls, dock walls and dams.

Experiments have proved conclusively that neat cement slightly contracts when hardening in air, and that neat cement when hardening in water shows a slight expansion. Mortars of cement and sand show the same effects, but in a much less degree. The following results have been obtained from experiments on expansion and contraction of neat cement, mortar and concrete:

Neat Portland Cement hardened in air at the end of sixteen weeks shows a 0.15 per cent. contraction.

One to three mortar hardened in air at the end of sixteen weeks shows a 0.05 per cent. contraction.

1: 2: 4 shingle concrete hardened in air at end of 21 weeks shows a 0.05 per cent contraction.

Neat Portland Cement hardened under water at the end of sixteen weeks shows an expansion of 0.015 per cent.

1: 2: 4 shingle concrete kept moist at end of 21 weeks shows a 0.02 per cent. expansion.

For shorter periods than sixteen weeks the figures would, of course, be reduced, and the expansion and contraction would be a trifle greater if a longer period ensued, but the chief movement occurs in the first period of thirteen weeks.

The contraction of concrete in hardening and under changes of temperature is considerable, and may cause the concrete to crack at irregular distances and open up widely. If a concrete surface is required to appear monolithic it needs a certain amount of steel or iron, not for the purpose of resisting the tension caused by contraction, but to overcome the tensile strength of the concrete and crack it uniformly through the length, in which case the cracks will be so small as to be invisible to the eye. The whole of such reinforced surface should be laid at one operation. The ratio of steel introduced should be at least .005 of the sectional area of the concrete each way, and the more this is distributed throughout the concrete, the more efficient service does it render. For this reason it is preferable that the metal should be in small sections and arranged in meshlike form, a layer being placed near each face.

Where the length is the only direction in which trouble may occur, vertical reinforcement is not required, so that rods placed longitudinally in a wall suffice, and are more economical. In arches and paving slabs of large area, linings to reservoirs, etc., meshwork or a lattice formed with rods of small section is needed. Expanded metal is also used for such purposes. Sharp angles should be avoided, or if unavoidable well reinforced by bars placed diagonally across them. There is very frequently more reason to ascribe cracks to the permanent contraction of the concrete referred to above than to temperature changes, but in some climates the variation in temperature is sufficient to cause cracks, and even if reinforcement be provided it would be well to insert expansion and contraction joints every 50 ft. Concrete exposed to water does not shrink in setting and hardening, so that concrete linings and walls of ponds, tanks, etc., are only cracked by changes of temperature between summer and winter. If they be of plain concrete, joints every 15 ft. are desirable; if of reinforced concrete, the joints may be 50 ft. apart, though it would be preferable to have them closer. Asphalt dowels may be inserted in the joints in order to prevent percolation.

Cracks sometimes occur through weakness in design and construction, such as by settlement in the foundations, too high a stress in the reinforcement, too shallow beams of reinforced concrete resulting in excessive deflection, too early and careless removal of forms, weak forms and early drying of their timber resulting in straining the work by shrinkage, insufficient allowance for the monolithic nature of concrete and reinforced concrete work and the effects of irregular loading and inadequate bond between concrete and steel due to spacing the reinforcements too close, using too dry a mixture and insufficient tamping, and omission of hooks to ends of rods.

ARCHITECTURE

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ARCHITECTURE AND ITS PLACE IN A GENERAL EDUCATION

By SIR BANISTER FLETCHER, F.R.I.B.A.

PART II. (*Continued from November Issue.*)

HISTORY in stone, or the architecture of the past, having thus been outlined, let us look at its place in the present educational system, first considering some reasons why a detailed study of the art has not hitherto been included in educational curricula.

Its absence has doubtless been largely due to its technical nature, and to the misconception formed by many that the lay mind could not embrace the forms and constructive principles of which it is the outcome. There does not appear to be any other valid reason that would account for the educational door having been so long shut upon such an important and entrancing subject. A stronger reason may probably have been the inability to deal with the subject from the educational point of view, because of the absence of readily available illustrations. To expound architecture to the layman without adequate views and plans is like merely reading a play instead of witnessing it upon the stage, and this lack of illustration must obviously have been a great deterrent, but fortunately this difficulty no longer exists.

Notwithstanding that architecture has been entirely omitted from educational codes of the past, there have always been "dilettanti" who have been worshippers at her shrine, and among modern writers it is well to remember that many, like Ruskin, Freeman and Fergusson, have had no professional education in the art. Many of the world's greatest men and rulers of the past were builders, or at least patrons of architecture, e.g., Rameses the Great, Darius, Xerxes, Pericles, Alexander, Augustus, Hadrian, Trajan, Constantine, Theodoric, Theodosius, William the Conqueror, Charlemagne, William of Wykeham, the Medici, Wolsey, Elizabeth, Francis I., Louis XIV., Phillip of Spain, and Napoleon I. Owing, however, to the march of democracy and the wider distribution of wealth, the patronage and protection of great men have been wanting in recent times, and as the people have not been educated up to the value of art in national life, the study of architecture has fallen into a state which is not likely to promote either good building or national interest therein. The art cannot thrive without the special fostering influences necessary for its production. Architecture is essentially a human art and it is also an affair of material and can only be carried out within the limitations thus imposed upon it. A painter may paint fine pictures that find no purchaser; a sculptor may model statues that remain in his studio; a musician may compose symphonies that find no orchestra; but the architect cannot construct cathedrals for which there is no ecclesiastical use, public buildings which a nation does not require, or dwelling houses which are not to be inhabited. Architecture has no place in most educational schemes because those responsible for them generally belong either to the classical or the scientific school and naturally think first of their own special subject. Thus a classical man includes history and literature, and omits the practical art which forms the background; while the science man looks after chemistry, geology, mineralogy, and other sciences, and omits any study of the buildings made by man out of the materials with which science deals.

The fact that music and singing are often included, accounts for the greater general interest taken in music by the public, and justifies its description by Symonds as the truly modern art. The history and literature included in modern education miss much human interest, because architecture—or the petrified history of the past—is scarcely ever mentioned. Surely the work of human hands is worthy of study, since it gives us an insight, not obtainable in other ways, into the thoughts, feelings and aspirations of the man who produced it.

Architecture, and the kindred arts of painting and sculpture, represent not only the thought of each period, which is likewise expressed in its literature, but they exhibit also the work of human hands, the buildings of all kinds which are the results of brain power or design and hand-power or costruction.

It is laudable that architecture has now, on the professional side, a seat within the portals of the universities, and that a B.A. degree in Architecture has been instituted in the University of London, and a degree of "Bachelor of Architecture" in the University of Liverpool.

It is more gratifying that, for the benefit of members of the interested public, courses of lectures on various periods of architectural history have already been provided at various centres through the progressiveness of certain modern educational authorities, of which London University is an example, thus extending tuition of University character on this and other subjects to the people at large; and from the large attendance at these the authorities have fully realised the fact that what they have provided was greatly needed and is much appreciated, particularly in view of the fact that the subject matter of the lectures is often given in relation to the general history of the period.

The inclusion of the art in the new scheme of the humanities initiated by the University Extension Board of London University is an important step, for true creative art is the grandest work of which man is capable, and the history of any period is incomplete without it. The whole scheme of work is arranged solely from the point of view of a liberal education, and not for professional or technical purposes, i.e., to advance its general study, apart from its adoption as a profession. Under this scheme, a Diploma in the History of Art, covering that of architecture, has been established.

All over the country at the present time scientific and strictly technical education, helped by large grants of money from the public purse, is advancing with rapid strides, and schools in business and other centres are being erected in furtherance of the forward policy of national education. This being so, at such universities as Oxford and Cambridge the study of the wider aspect of life, ancient and modern, should include all branches of the culture and art of all ages. These centres of education are essentially the places where we might reasonably expect that the history of the humanities should be welcomed, and that the student should be able to obtain instruction in the principles of the art of past ages. Architecture is much more worthy of inclusion in a general education than several subjects one might mention that have secured recognition.

As regards the technicalities of the subject, it should now be patent to all that these, which are much simpler than in many of the sciences, can be easily learnt by the average student, and that a lecturer, imbued with the absorbing nature of the subject, can invest it with human interest and explain the necessary technical details graphically so as to make it intelligible to the general student.

The inclusion of architectural history in any scheme of liberal education seems to be not only facilitated but also rendered more necessary for many reasons, a few of which can be briefly enumerated.

Modern facilities for travel have done much to arouse a genuine interest in the architectural works of the past in different countries. The personally conducted educational expeditions which have been popular during late years are also largely responsible for the desire among travellers to know something of the forms of art which are thus brought prominently before them. Photography, too, has been an important factor in interesting a large section of the community, especially of the travelled and educated public, and "dilettanti," in matters of art and architectural history, and has caused a thirst for knowledge on the subject, which can best and most easily be obtained by attendance at lectures in which it is systematically dealt with. The general spread of education in matters of art has caused a yearning for a knowledge of architectural forms such as is provided by the educational scheme already mentioned.

Further, the use of lantern slides, the importance of which must not be overlooked, rendering possible the adequate illustration of the various forms and features of each period to large audiences, has given an added interest to such lectures, and has awakened an enthusiasm for the subject which could have been brought about by no other means.

Photographs in conjunction with lantern-slides enable examples of the art-history of any period to be shown and dealt with "seriatim," because by means of photographs of detail and ornament the subject can be illustrated and the process of evolution and design made clear, so as to be entirely comprehensible to the least imaginative.

We have seen in the general history of European architecture how its various forms resulted from the social, political and industrial conditions of the people, and how this intimate connection influenced contemporary art.

We have also seen why its study has not been included in past schemes of so-called liberal education, and why its inclusion was not easily rendered possible. Let us now consider the probable results of such inclusion, and the benefits to be derived by the general community.
I plead on behalf of every person to whom a liberal education is desirable, not as a means of enabling him to gain a living, but as fitting him to enjoy his daily existence to the utmost extent. Travelled and cultured people are included in this class, and for them each type of architecture must be bound up with the causes —geographical, geological, climatic, religious, social, and historical—of which it is the result, and its intimate connection with all these must be shown more clearly than is possible in a technical course for young students.

At present many people who wander amongst the beautiful and soulful creations of the past are unable to appreciate either their meaning or their qualities, owing to their ignorance of architecture. To them form has no meaning, and a Greek temple, a Roman amphitheatre, or a Gothic spire, fails to recall the conditions which render each a reflection of its own period in history.

The inclusion of architecture therefore in any systematic course of instruction seems essential and will give to those who study it a general outline of the arts of form and a clearer perception of the trend of humanity in past ages, which is necessary to a complete understanding of history. It will also give an additional pleasure in travelling, through awakened interest in the great works of architecture, and because of the knowledge acquired of the place of each work in the evolution of art.

To know something about pictures, to talk with an air of knowledge about the various schools of painting and sculpture, and to show an acquaintance with the galleries in which they are found has long been fashionable; but has it been realised that with a knowledge of architecture each street is a picture gallery which every one may enter without so much as the payment of an entrance fee?

The late Bishop Creighton once said at an architectural gathering that "architecture is the most democratic of the arts, that it goes literally into the market place, that it is for everybody, and that rich and poor alike may enjoy it." How essential, then, it is for the production of well-designed buildings that the patrons of architecture—the public—should have a desire for good buildings! Then consider the individual buildings; have not a great number of them been erected by a general mass of the community in past ages? Are they not in the highest degree human; for can we not see the marks of saw and chisel, made maybe hundreds of years ago, but still telling us of the methods of construction, craftsmanship and design of the time? Again, our free gallery of buildings varies with the day and time of year; we may see them in the haze of early dawn, in the full flood of noonday sun, in the dimness of twilight, or in the weirdness of moonlight, while in the change of seasons we get that variety which gives them life. No special lighting is necessary for the works of the architect, which form a setting for the work of sculptor and painter.

The sense of environment, and the effect of the weather, which gives colour and texture to the walls and lichen-covered roofs, add to the enjoyment obtainable from the study of an old cathedral, and intensify the influence of a beautiful building upon all who pass and repass it daily. By environment we mean not only the position of the building on some specially interesting spot, but the environment of the period to which the buildings belongs, viz., the history of the time and of the people who helped to erect the structure. If we study either architecture or history aright, we must get into the "atmosphere of the period." It may be said with some truth that history has been to architecture what steam is to machinery, the grand propelling power; while, on the other hand, architecture has been the printing press of all periods.

Architecture is, indeed, more particularly entitled to the attention of the general student than any other of the fine arts, because it calls into action so many and such varied branches of mechanical labour, and because operating thus extensively upon industry, it also promotes national prosperity. Hence the dissemination of a taste for it among the middle as well as the more opulent classes of the State is not only sound national policy, but also important as likely to lead to more direct and obvious artistic results.

Therefore, in these days of enlightenment, and in the interests of true as against superficial education, is it not expedient to provide for the study of architecture and its connection with history in the curriculum of education? Is it not the art that shelters us from the elements, and on which we are daily dependent; the art which gives us "home"; the art which enshrines and illuminates the most sacred of our associations, forming and fashioning the ornamentation of religion, which it aids by the mystery of its light, shade, and colour; the art which has been and is the outcome of conditions intimately bound up with the history of the human race? Finally, is it not the art which is the mother of all arts, and from which sprang painting, sculpture, and all the allied arts and crafts of succeeding ages of development?

The time spent in the study of such an enthralling subject will not be regretted, for every ruin will then tell of the history of other days, and will reveal the character of the men of the period in which it was erected. It will open up the enjoyment of the contemplation of buildings of which the meaning will be appreciated, and enable us to realise more fully the truth of Longfellow's lines:

> ". . . . . Ah, to build, to build,
> That is the noblest art of all the arts,
> Painting and Sculpture are but images,
> Are merely shadows cast by outward things
> On stone or canvas, having in themselves
> No separate existence. Architecture,
> Existing in itself and not in seeming
> A something it is not, surpass them
> As substance shadow."

NOTICES

Architectural Competition for Australian National War Memorial to be erected at Villiers Bretonneux, France

Competitive designs are invited for the above from Australian Architects or Designers, who enlisted for service in the Great War with the land or sea forces of the British Empire, or whose sons or daughters enlisted for service with these forces.

Printed conditions regulating the submission of designs may be obtained on application at Military Headquarters in the Capital City of each State of the Commonwealth.

The closing date for submission of designs is 30th April, 1926.

Department of Defence,
16th November, 1925.

T. TRUMBLE,
Secretary.

Intermediate, Final and Special Examinations of the Royal Institute of British Architects

INTENDING candidates for the examinations of the Royal Institute of British Architects are reminded that the next examinations in Sydney will be held in April, 1926, provided that three or more candidates make the necessary applications on or before the 15th January, 1926.

Relegated candidates will be required at their second and subsequent attempts, to pay a fee of ten shillings and sixpence for each subject in which they have been relegated on each occasion upon which they present themselves for examination.

INSTITUTE OF ARCHITECTS OF NEW SOUTH WALES

GENERAL MEETING

SYDNEY, 3rd NOVEMBER 1925

MR. HOOKE (Vice-President) occupied the chair. Apologies were received from the President (Sir Charles Rosenthal), Messrs. J. C. Adams, H. Gardiner-Garden, V. Vernon, N. Weekes, G. Sydney-Jones, and J. C. R. Mills.

The Minutes of last meeting were taken as read, and confirmed.

Arising out of the Minutes, the Chairman mentioned that it had been decided to suggest to the Council that definite action be taken, protesting against the congested state of the Sydney Station and the unsightly advertising. The matter had been referred to the Council, and a Civic Protest Committee had been formed, which it was hoped would be able to make a report at no distant date.

The Chairman also announced that at the next meeting, to be held on 1st December, the President, Sir Charles Rosenthal, would lecture on "Architectural Progress in N.S.W.—A Review."

Colonel Hurst read a Report from the Board of Architects, covering the last quarter's work.

MEETINGS: A Committee Meeting and six Board Meetings where held during August, September and October. Professor Wilkinson has left for Europe. The Board wished him a safe journey and a pleasurable and profitable time whilst abroad.

The Senate has been addressed with regard to the representation of the University of Sydney on the Board.

REGISTRATIONS: The application of Mr. Louis Reginald Williams was approved and two applications were declined.

RESTORATION TO REGISTER: The Board decided to restore the names of Alfred Potter and John F. Augus to the Register.

WITHDRAWALS FROM REGISTER: At their request the names of Charles W. J. Carter, George R. Thompson and Alfred E. Withey were withdrawn from the Register.

SECTION 19 (3): The Board has agreed to a stay of proceedings in a case before the Court for a breach of Section 19 (3). Suitable action has been taken with regard to the use of the word "Architect" by unregistered persons.

RECIPROCITY: Further communications have passed between the Board and the Architects' Registration Board of Victoria on the question of Reciprocity.

ROLL FEES: An extension of time has been granted to a number of architects, on account of their illness or financial stringency, for the payment of the annual roll fee.

TRAVELLING SCHOLAR: Mr. William Ray Laurie, the first travelling scholar to return to this State met the Board. He furnished a number of pencil sketches, many small photographs, gave an account of his studies abroad, giving information as to the places visited, costs of living, the conduct of architects' practices in other countries and conditions governing employment in architects' offices. A record has been made of his experiences and it is anticipated that this will prove helpful to other scholars proceeding abroad.

It is proposed to arrange with Mr. Laurie to give short "talks" to University and Technical College students, to offer selected drawings for the Institute of Architects' Exhibition and lecturettes by him during the Exhibition period, also to enlarge some of his photographs and put them in album form.

BOARD OF ARCHITECTS OF NEW SOUTH WALES ENDOWMENT FUND: The Board fees of several members have been paid into a bank to constitute this Fund.

AUSTRALIAN MEDALLION: Competitive designs have been received. It is the Board's intention to arrange with the competitor whose design is accepted to execute the medallions ready for reproduction and to pay a further premium at a figure to be agreed upon.

FAIR RENTS (AMENDMENT) ACT, 1925: The Board considered this measure inimical to the best interests of tradesmen associated with building operations and to archiectural practitioners in a small way of business. The President has placed the following resolution before the Hon. T. D. Mutch, M.L.A., Minister for Education, and the Hon. W. J. McKell, M.L.A., Minister of Justice:

> "This Board views with grave alarm the proposed action of the Government in introducing the Fair Rents (Amendment) Act, 1925, the provisions of which, combined with the 44-Hour Bill, will seriously affect both the practice of architecture and the work of the building trades throughout the State, leading to increased unemployment and a wholesale slump in real estate values."

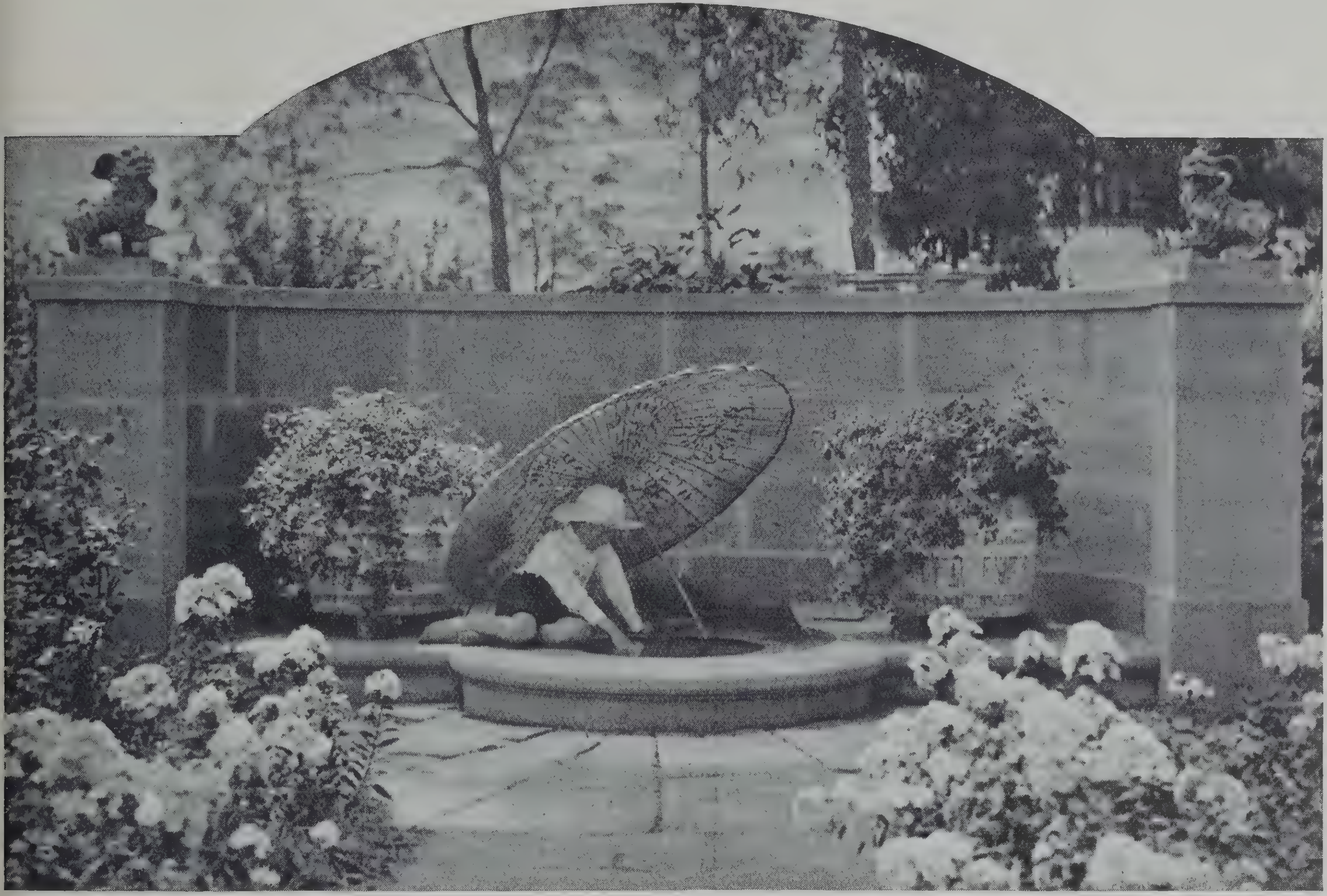
The Master Builders' Association has been informed of the Board's attitude and action and requested to co-operate.

PRESCRIBED EXAMINATION: Exemption has been granted in some subjects to probable candidates for the next prescribed examination of the Board to be held during the first fortnight of March next.

CREDENTIALS have been supplied to Kenneth A. Odling and Keith B. Hudson, who have gone abroad to pursue their architectural studies.

DECEASED ARCHITECT: The sympathy of the Board has been conveyed to the widowed mother of the late A. S. Lupton, War Service Homes Commission, who died on the 30th June last.

The Chairman, in a few words, introduced the lecturer of the evening, Professor E. G. Waterhouse, who spoke on "The Garden and the Home."



The wall fountain and bird bath opposite the study door. The semi-circular wall is of Waverley freestone, and on each pier are old Chinese porcelain Kylins.

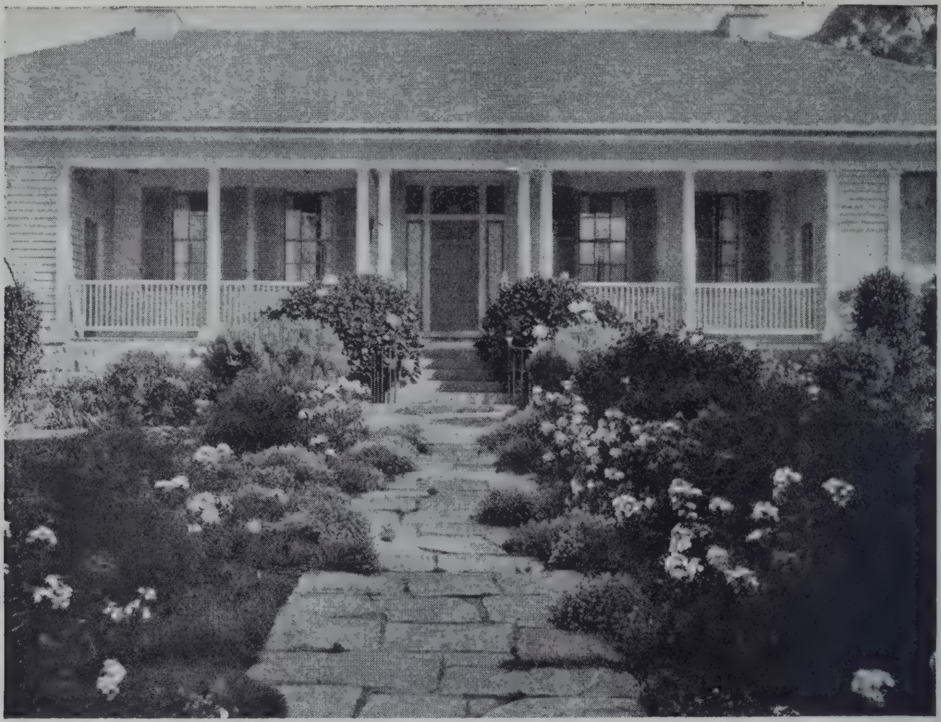
THE GARDEN AND THE HOME

Lecture by PROFESSOR E. G. WATERHOUSE

With Photographs by Cazneaux of the Lecturer's Home

IT is the intimate and harmonious association of these two—the Garden and the Home—that I wish to stress. I am not speaking merely from the horticultural point of view, although horticulture is an essential attribute to gardening. I distinguish the two. In actual practice there is a separation often between gardening and architecture. That is, there is no real expressive relation between the garden and the home, except that the people in the house do the gardening. Here is the house and here is the flower garden, but take the house away bodily, and the garden would in some cases not suffer. Remove the garden, and the house is just as expressive or inexpressive as it was before.

The reason I chose my present subject, when the Institute of Architects did me the honor of asking me to deliver an address was because in some ages in the past, gardening has been considered to be a branch of architecture, and theoretically you will admit that it still is, yet how many architects to-day provide their clients, as a matter of course, with a plan of the garden to accompany the house, and how many domestic gardeners would welcome any such suggestion from their architects? The question has only to be asked to be answered. There is an unfortunate divorce between architecture and gardening, and yet there exists in the community undoubtedly a very general love of flowers, and a love of gardening.

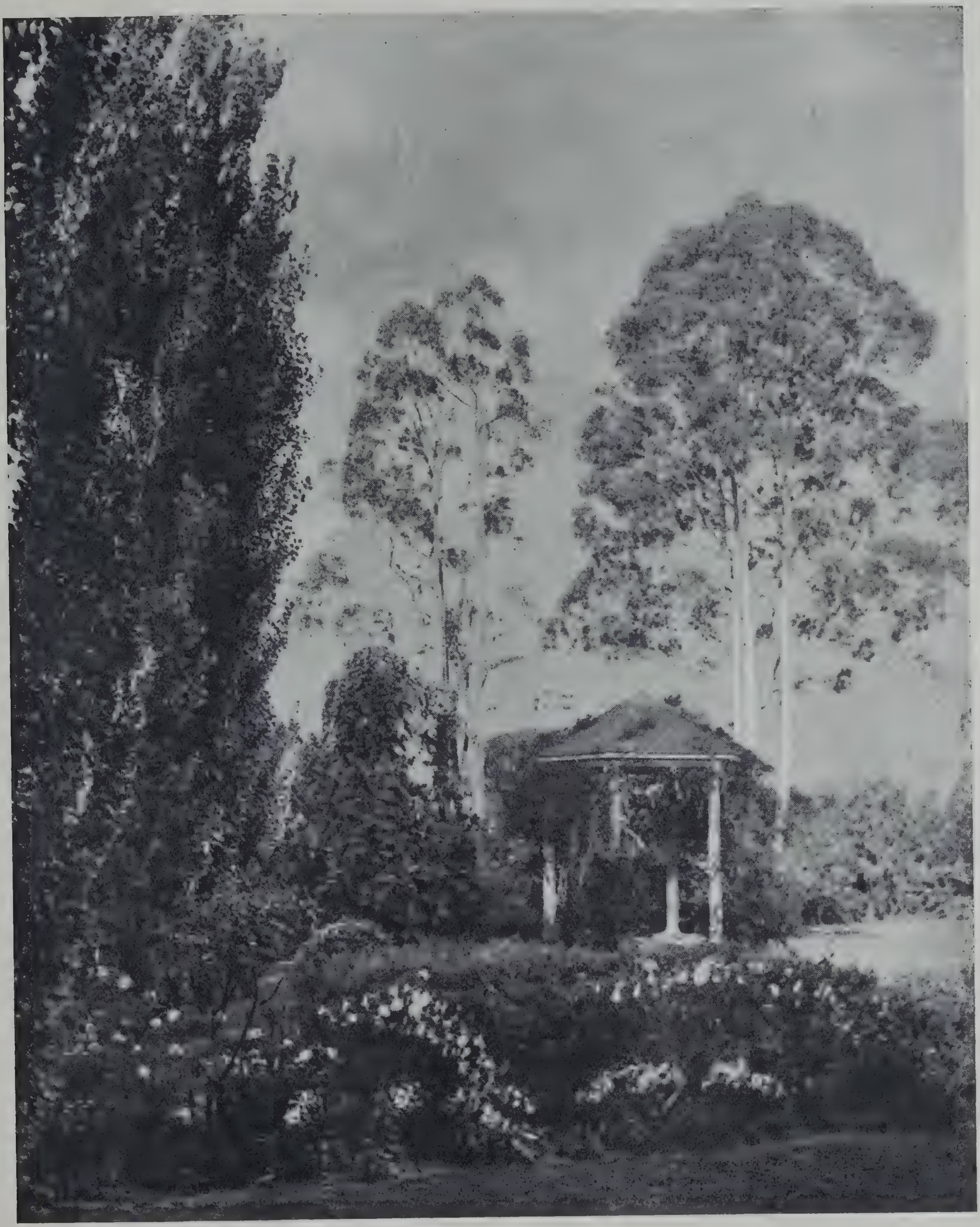


General view of the house, looking from the front gate up the stone-flagged path, lined with perennial phlox, red china roses and sweet allysum, growing between the stones. The walls of the house are of brick bagged over and coloured white, the shutters painted a pale grey, and the roof covered with Sherwood shingle tiles, irregular in texture and varied in colour. On either side of the long verandah are the sun rooms and the sleeping verandah.

I doubt whether the percentage of amateur gardeners is as high in any other part of the world as in Australia. That is the impression I get from noticing the number of people actually busy in their gardens. Walk through any of the suburbs on a Saturday afternoon, and you will see hundreds of householders at work with spades or mowers. We are a garden loving community. Enormous energy and considerable sums of money are expended weekly on our gardens. The result is, on the one hand, increased health and the best of happiness, and on the other, an enormouse advance in the science of horticulture. We know how to grow specimen flowers, and the exact treatment to give this plant and that, and we are able to produce flowers such as have never existed in the world before.

All this is cause for the utmost gratification. We rejoice in the achievement of the horticulturist, and acknoweldge the inestimable benefit he has conferred on the community. In thus rejoicing in his success, there is only one thing that we may deplore, and that is that while the science of horticulture has been making such strides, the equally important art of gardening has lain neglected and undeveloped, comparatively speaking. The horticulturists have been growing raw materials. They have provided us with a most varied palette, but few gardeners have as yet attempted to combine the colors, and to paint the picture. We have not been able, in some cases, to see the wood for the trees, or rather to see the garden for the plants. We have had this in our gardens, and this, and this, the latest in everything, and as we have been dealing with plants, with living things that grow by natural processes, and are only partly under control, we have perhaps been rather averse to the idea that there should be any plan in what we suppose to be a purely natural process that the garden should be a unity in itself, just as a room in a house is a unity, and that it should bear a relation to the house, just as a room bears a relation to the rest of the house.

I am sure to many an amateur gardener, such an idea seems rather like affectation or artificiality. He has got his garden, and he is very well satisfied with it. Great undoubtedly as is his joy, we



The temple in the front garden set under blue gums. The old fluted Ionic columns carry a simple roof of shingle tiles, and between the columns climbing roses and jasmine creepers entwine. On the left is a fine range of poplars lining the street front.

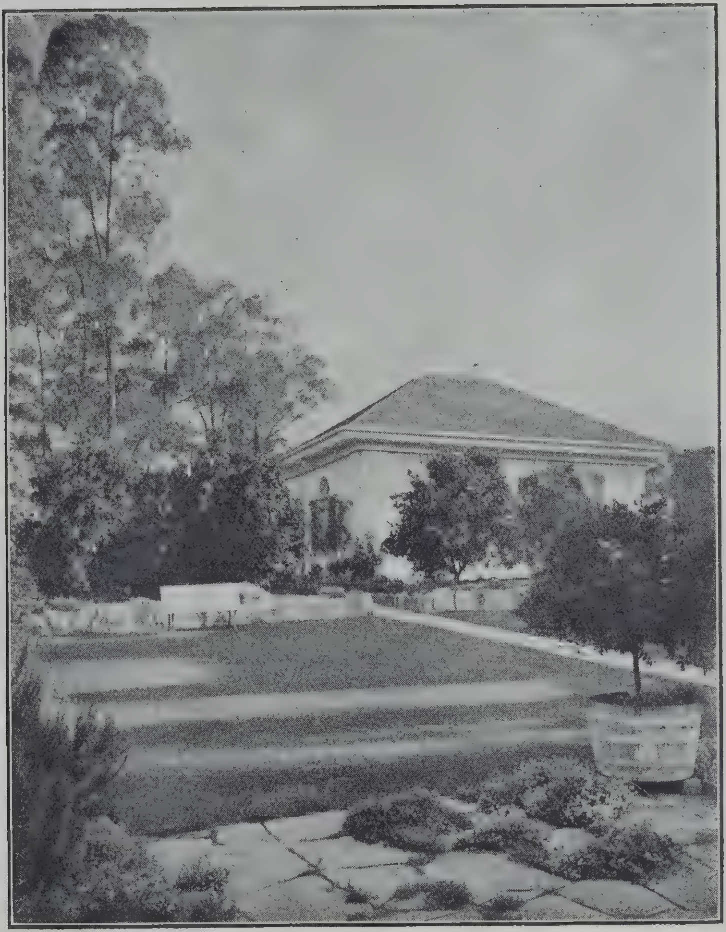
could wish that he could know the still greater joy that may be his if he agreed to further exercise his mind creatively, instead of often carrying on with but hardly a half conscious idea of what he is out to achieve in his garden, other than the production of an array of all kinds of flowers. That joy may be had by associating the loveliness of nature and the loveliness of architecture, by making one's garden an essay to a certain extent, with the aid of beneficent nature, in self-expression, in the sense that the individual attempts not merely to assemble flowering plants, but to give a deeper interpretation of their loveliness, and of the beauty of their texture, form and color, not only individually, as many horticulturists certainly do, but in combination, so that the gay flowers and their setting may sing together in the garden in one harmonious symphony.

If this is desirable, that the garden and the home should form one harmonious whole, where are we to learn to practice that expressive art? From the architect? The ground plan no doubt we could learn from the architect, but few architects have so specialised in this branch in detail, apart from the ground plan, as to be able forthwith to give more than most general suggestions. It seems to me that the gardening I have in mind should become a necessary branch and adjunct of the architect's work, but until it develops, to whom may we turn? Shall we turn to the professional landscape gardener? Usually he has had no artistic training. He is in many cases a gardener in a larger way. He knows his plants, how to grow them, how to treat the soil but he has had no schooling as a ground work for the expression I suggest. The good effects that he may achieve are often accidental. What many landscape gardeners propose is often in itself a denial of art, and a failure to offer any unified scheme. They will propose, for instance, that all trees should go, and that you should have a winding path. They know the conditions most favourable for the growth of plants, but they are not in the larger sense garden planners. They will give you useful hints for the growing of plants and flowers.

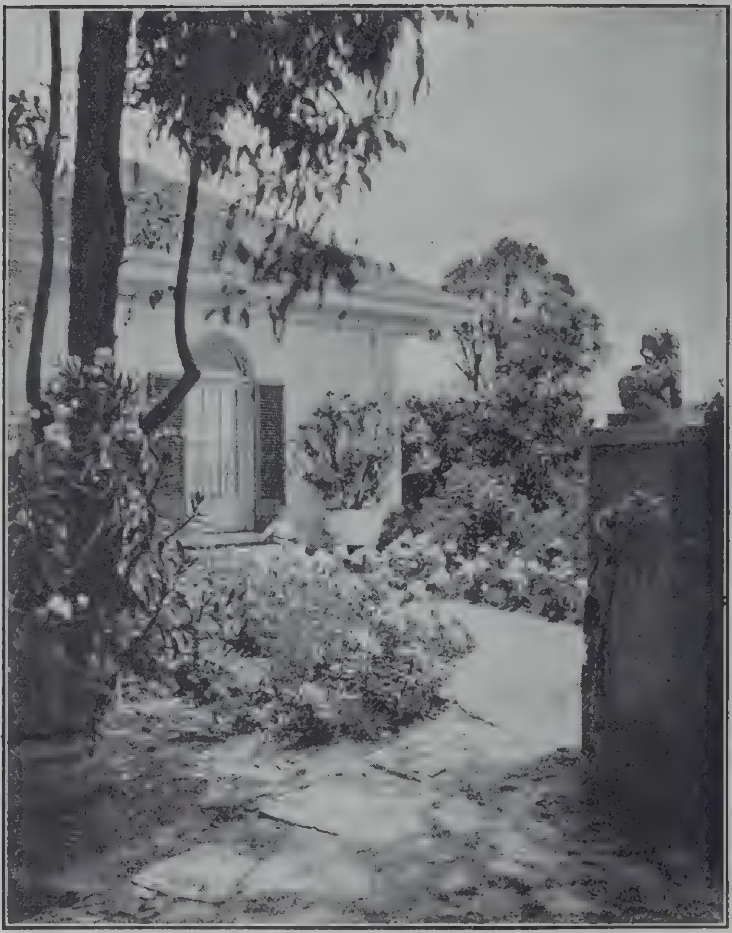
Until the art is developed in our minds, and exemplified in many instances, each one who wishes to achieve the ideal which I have set before you, can only learn by his own experience, by observing the gardens of others, and making experiments in his own. In so doing, any improvements he will make will be colored largely by his own tastes, and sometimes by his prejudices, and the remarks I have to make to you are offered in that sense. I submit them not as the solution of the gardening problem, but as one point of view of treating gardening as in a certain sense an art of expression, using the beauty we have so lavishly around us, and planning and interpreting it according to our own individual view and tastes. Any art, as it perfects itself, must show some form or pattern, must show the crystallisation of an idea, if not the solution of the problem. That is, there must be some definite expression.

The interior of a home is an essay in self-expression. Similarly, the garden may be, and in many cases, it is even a more fascinating problem. In a home, each room is a small part of the house, and the garden should be considered as a room having relation to the whole. The house by itself, when freshly built for you by the architect, is an abstraction. It needs its tenants, and it needs its setting to harmonise it with the life that has to be lived there, and the garden becomes an interesting transition between the rather (in some cases) abstract conception in building and the luxuries of nature in its wildness. The garden may be the finest room in the house, for I would have you enlarge your idea of the home, and have it limited, not by its four walls, but by the boundaries of your property.

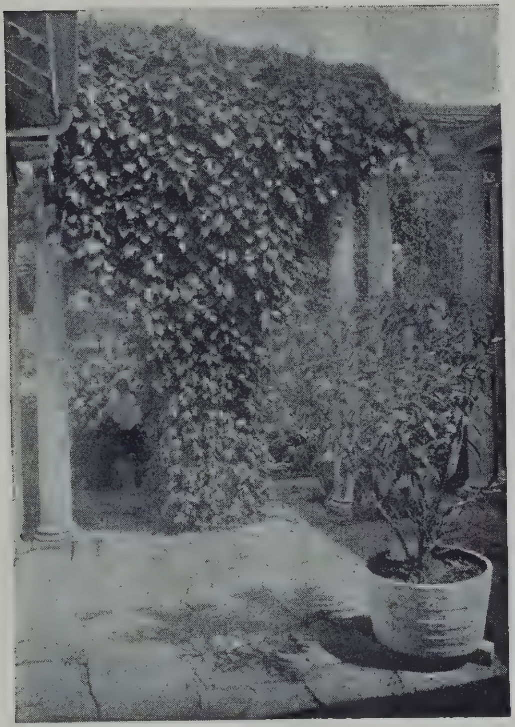
Let us then consider the garden as the great open-air room of the house, to be considered so both from outside and from within. From within, in connection with the prospect of your garden that you give those who are in the home. We are at some pains to determine the size of the room we live in. It will some day be equally general to give thought to the planning of our gardens. Let us consider the boundaries fixed, and the house built. That is a problem that is solved by the architect. Let us suppose we are ready to lay out our garden. This forms then the boundary lines of our open-air room. We have to erect on these lines the walls of this principal room. The walls have not to be built in this case, but grown. They are its hedges and trees. They give it definition. A garden entirely open to the public (which is rather the general type of our suburban gardens) loses in many ways compared with what is possible. It loses as much as a room would lose if we left its furniture standing, but removed its walls. The relation between the furniture left so standing and the wide open spaces of air is not an effective one. The charm of the room has been allowed to leak out and escape. So too with the garden. The boundary lines—the frame of the garden—are in many cases lacking, and we gaze forth on whatever view there may be, in some cases delightful, but in others, an increasing array of telephone wires and telegraph posts, and the often inharmonious architecture of neighbouring houses. It is different if there is a vista, but



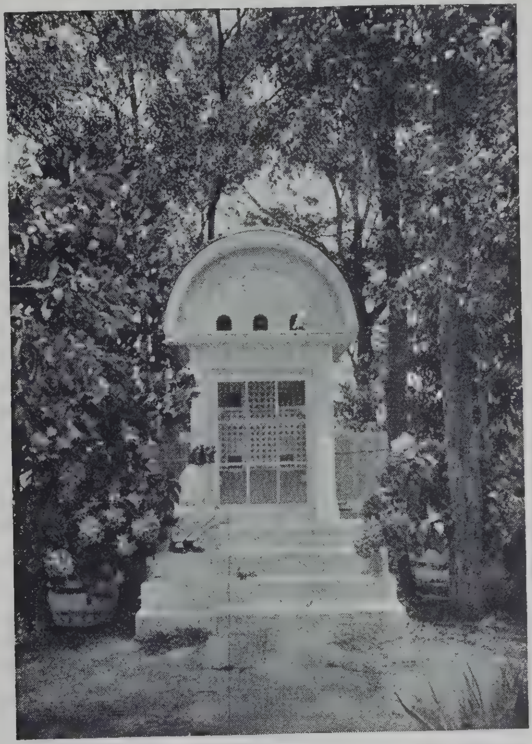
View across the back lawn, showing the study set in the garden amidst the orange trees.



Another view of the study from the opposite angle, showing a corner of the wall fountain.



(Left) Across the courtyard on the other side of the house, which is stone-flagged, and ornamented with oleanders, grown in white tubs. The fluted columns are of cast-iron and carry a wooden cornice, covered with shingle tile capping.



(Right) The pigeonhouse at the end of the flagged path leading to the study in the back garden. The walls are of brick, standing on a brick plinth, and the whole bagged over and coloured white. A note of colour is given by the gilded tympanum in the semi-circular pediment. The roof is covered with hardwood shingles.

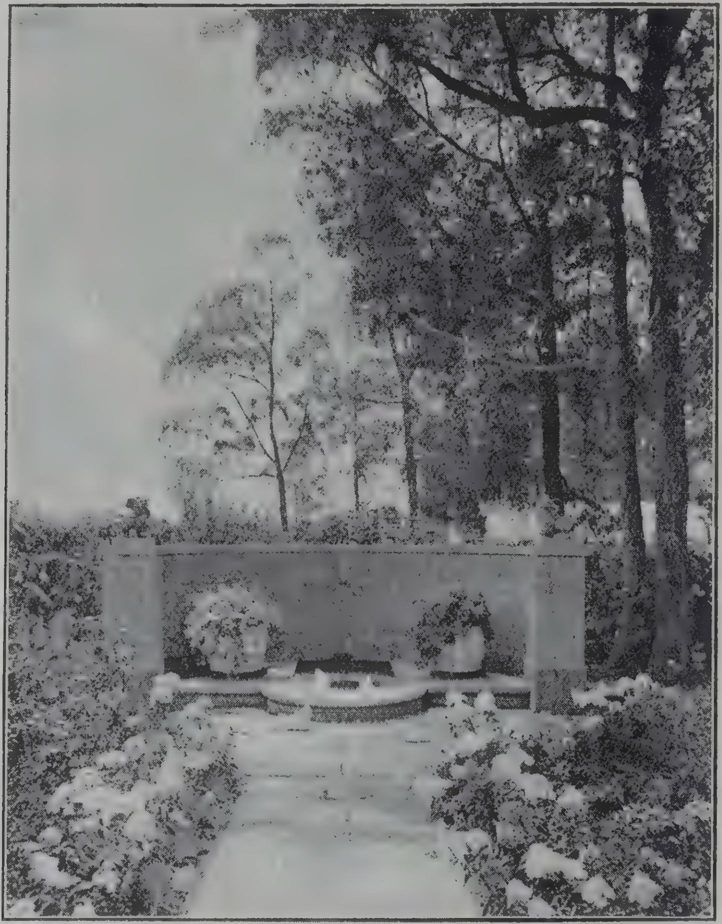
that is rather the exception—it is not the rule with the large majority of our homes. Therefore the function of the hedge is a very important one.

I admire the spirit of the people who leave their garden open to the public gaze. It beguiles many a weary half-hour or quarter of an hour, as one returns home from one's work, or goes forth in the morning, to have some view of pleasant flowers. Still, if that is the aim, it may be achieved equally by having hedges, and gapping them so that the public may look through, and they will then have the picture framed for them. Therefore, the hedge of shrubs or trees gives the definition we want, and will help to enclose the inner garden, and give us a foil for our color. I have heard of the wonderful gapping in the hedges at Kensington Gardens, which gives wonderful and delightful vistas of the sunken gardens there, and also at Hampton Court. Much greater charm will be achieved if this be done. It gives greater quietness and privacy for the home, which becomes a retreat from the world, and the garden becomes a place where one can read and receive one's friends—a true open-air room. This is impossible if all is open. There are other practical reasons which I need not stress. The dust caused by motor-cars enters and deprives us of part of the pleasure of our open-air life.

The growing of hedges seems to be more important than any other single consideration, when first laying out the garden, and this is important, not only along the front but along the side. The charm of the most congenial neighbours is not always shared by the houses they live in. The view is sometimes so bad that you must shut it out, if your garden is to be self-contained.

The selection of a hedge becomes of great importance if we are to retain control over our garden, and make it express what we would wish it to do. The hedge of trees or shrubs may become a great source of loveliness. Its principles are those of unity. They are the boundary lines. In a room we do not very much break up our walls. We allow variety otherwise in a room. So with our garden. There will be a certain uniformity.

The same types of treatment are requisite here as in a room. If we have a frontage of from 60 to 100 or 120 feet, and we are going to have the same tree or the same shrub, the question of



A general view of the fountain and bird bath from the door of the study, showing the garden setting.

On either side of the flagged path are perennial phlox and red roses, and in the white tubs cherry pie. Behind the stone wall is a hedge of pomegranates.

texture becomes important. If there is a repetition of the same forms, it is important that this should be interesting. It is important that the shrubs should have density, and that the growth should be commensurate with expectations. Perhaps one of the most delightful hedges is the common olive.

Another favourite is the simple privet, though it is sometimes disliked on account of its somewhat disagreeable perfume. You may prevent it flowering if you trim it regularly. If allowed to flower, it becomes a great source of attraction for birds. Still another is the laurel, which does not grow very well about Sydney. Of the three I have mentioned the privet is the quickest grower. Another interesting hedge is the bignolia, but it is not in the same class as the others I have mentioned for texture. The hybiscus is a good flowering hedge, but is subject to disease, and apt to be gappy at times. The common red one is perhaps the hardiest and the best in its massed effect. Then there is the hedge of roses, particularly the red letter day rose. It is a good doer, but I am afraid if you have that hedge in front of your garden, you will not have it permanently, because you have to continually cut it back. There is this disadvantage with flowering hedges on to the street, that the dust is apt to soil your flowers. The flowering hedges are most lovely when they are somewhat enclosed, when you have them as secondary hedges within your enclosure.

If you have a hedge you have a long horizontal wall running in many cases parallel to your building, and it is very interesting to counteract that double effect of horizontality by perpendicular lines, and I have seen interesting effects by the upward trend of the poplar, which is delightful at all times on account of its beautiful rhythm and wonderful leaf. The rhythm is preserved even in winter, when the poplar presents that beautiful fanlight tracery against the blue sky and white clouds. I think it is interesting to have in our gardens a few deciduous trees such as the poplar or the cypress, behind the evergreen hedge of privet, olive or hawthorn. These trees placed

From the Garden Temple.

A view of the front garden from between the columns of the temple looking along the stone flagged path to the garden seat.

On either side of the garden seat are white terra cotta tubs holding mandarin trees.

behind the hedge give an interesting view and make a nice approach. I would sing the praises of the poplar in spring, summer, autumn and winter. In the Spring it opens and preens itself in the rains, in which it seems to take a conscious delight. In summer you get those wonderful large leaves at the top, which are like plumes to the tree. In winter, when there is no sudden change of temperature, you get a wonderful fall of gold. The poplar is a source of never-ending delight, and is always alive with its whisper. Another tree, interesting in its formation, is the white cedar, now in such lovely perfume, which is also bare in winter, and which has most interesting berries, which hang throught the winter. Another tree, which is the robber, is the acacia, which has beautiful wisteria-like flowers. It will grow in the most arid soils, and is best planted where you have nothing else that is of great importance. I have often wondered why we do not do more with it here, particularly in gardens which we cannot afford to attend to very much.

Let us suppose we have our walls. We have now to plant our garden, make our paths and our open lawns. The next thing is the disposition of the furniture in this our open-air room, and here some treatment of formal shubbery is a great help in linking together the garden. The arrangement of shrubs is of great importance in giving beauty and personality to your garden. They will aid in the treatment of your flowers. They will take away some space, but if you use the spaces still available, I think you will get a better unified scheme and more delight from your garden, that is, if you are building it up in relation to your home. These shrubs become the subsidiary pieces of furniture. As in the room you fill in the spaces, so too, you will get the best effect if you use your furnishing shrubs in relation to your home.

In order that my remarks may not be just adstract, and that you may visualise them, I would like to speak of the arrangements I have made in connection with my own home, illustrated with slides. I can interpret my own scheme better than other people's, and I give you that one point of expression simply as an attempt to solve the particular problem that I had to solve, and not any other.

INSTITUTE OF ARCHITECT'S GENERAL MEETING—*Continued*

MR. HOOKE: We knew this was going to be a wonderfully interesting lecture. We were so anxious that our members should not miss it that we sent out special reminders. If Professor Waterhouse will be good enough to give us another lecture, no reminders will be required—we will need to take the Town Hall. Our Institute has been very fortunate indeed in that we have recently had such a large number of gentlemen not connected with our profession, who have been so good as to come along and give us such interesting addresses. I am sure there is no one here to-night who will not remember this particular lecture with feelings of the liveliest satisfaction. In fact, I think there will be a wild rush of gardening during this coming week end, and I think there will be a bit of a pilgrimage up to the Professor's house, and many people will be looking over the fence, as the small boy looks at the cakes in the cake shop. I cannot help thinking what a fortunate man Professor Waterhouse's architect is. I only wish all our clients were like the Professor. Some of us have been wondering how large the garden is. We would imagine it ran to acres, but actually I believe it is not a large place.

MR. DE PUTRON: In moving a vote of thanks to Professor Waterhouse, I feel I am only echoing the sentiments of all who have been fortunate enough to listen to his lecture to-night. It has been an eye-opener to me, and I think we owe him a debt of gratitude. He has handled the subject in a most capable manner, and has reinforced his remarks by showing us on the screen what he has succeeded in doing. He has shown that he knows exactly what he is talking about, and the views of his garden have perhaps made some of us a little envious. The atmosphere of the garden I am afraid would make us somewhat lazy, and wish not to go to work. The Professor remarked that the architect should be asked to design the garden. Unfortunately, we architects are only too pleased to be commissioned to do the house. If we suggested laying out the garden, the first thing the client would say would be, "This man is after additional fees." We have, however, on several occasions assisted the client in laying out the garden.

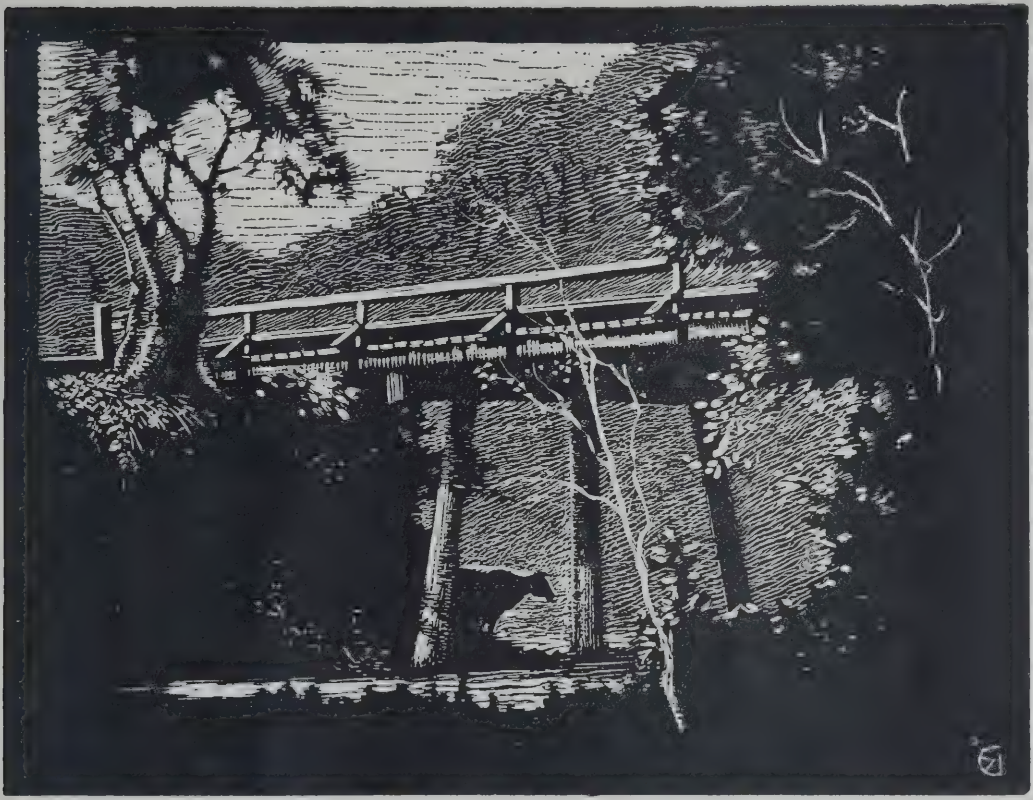
MR. AUBREY KERR: I have great pleasure indeed in seconding the vote of thanks to Professor Waterhouse. It has been a great delight to me, and I have enjoyed every minute of it. I have always thought that the architect should be employed to design the garden as well as the home. From the delightful tour of inspection on which he has taken us, we have seen the way in which the Professor has built up the open-air room of his home, the straight and not the winding path, the masses of different flowers, the horizontal as contrasted with the vertical, the various trees and hedges, flowering at different times of the year, and the poplars with their beautiful tracery in the winter.

MR. HARRIS: It gives me great pleasure to speak in support of this vote of thanks. We have had not only one of the most enjoyable, but one of the most instructive lectures we have ever had. Professor Waterhouse has shown us what a garden can be. As he himself suggested, there are probably few countries in the world where flowers are grown more scientifically and with finer results than in Australia, but there are fewer countries where gardening is so little known. One feels that a garden is a place to wander in, and not merely a place to rush into and grab a few flowers. Unfortunately, too many of our gardens have wonderful flowers, but are not places for rest. The Professor has shown us how it is possible, even on a small scale, to have a garden in the true sense of the word. He has also refuted the idea that the first thing to do is to clear every tree off the site.

MR. RICHARDSON: As one who on many occasions has had the privilege of visiting Professor Waterhouse's garden, it gives me great pleasure to support the vote of thanks. I am sure the photographs and the descriptions we have had this evening have brought home to us what can be done in the way of making our gardens beautiful. One of the lessons we may learn from the lecture is the value of planting shrubs which are there all the year round. Many gardens fail in that respect, and for the many months in the year when there are no flowers the gardens are bare. Not only has the subject matter of the lecture been most delightful and interesting, but the Professor's method of presenting it has been charming. Professor Waterhouse's initials are E.G., which, as you know, stand for "For example." If we take his garden as an example, we will not go far wrong.

MR. B. J. WATERHOUSE: I certainly would not like to remain absolutely voiceless on an occasion which has given me such great pleasure. The collection of photographs and the wonderful architecture that were shown indicates that success has been achieved by a combination of two talents, that of the architect and of the accomplished gardener, which together have produced (as I think all architects will admit) one of the gems of the environments of Sydney. The white of the house is a lovely background for the garden. The shadows really become of great value when thrown upon those beautiful walls. In a country like ours white and cream should be used far more extensively. My plea is for the abolition of the blue-black. The lecture would be of great value to any one contemplating building a home. I only wish that every one of the Professor's words could be recorded in our journal.

PROFESSOR WATERHOUSE: I thank you for your very flattering reception of my address. It has been a great delight to me if I have been able to give you any stimulus, and in any way increase and intensify that love of beauty which I know all architects have. The frontage of my land is 130 ft. by a depth of 240 ft. The garden does not go back so far. The house is less than 60 ft. from the street. I have not lectured to you in the hope that you will admire what I have done, but in the hope that it will stimulate you to follow such principles as may be true among those I have enunciated. I should be deeply disappointed if my remarks tended in any way to make you dissatisfied with your own gardens or envious of what I have been able to achieve. You should do as I did, take your own garden, and realise its possibilities. I would emphasise every word that has been said about that most dismal, dreary and deadly blue style, which has invaded our suburbs. It is gloomy and depressing, and I cannot understand how any one can love it. I hope we will in this land of sun love color, re-act to it, feel its joy, and get it into our lives, the joy we ought to have through our color and the art of our gardens and of our architecture. I thank you for your deep and too generous appreciation of my remarks.



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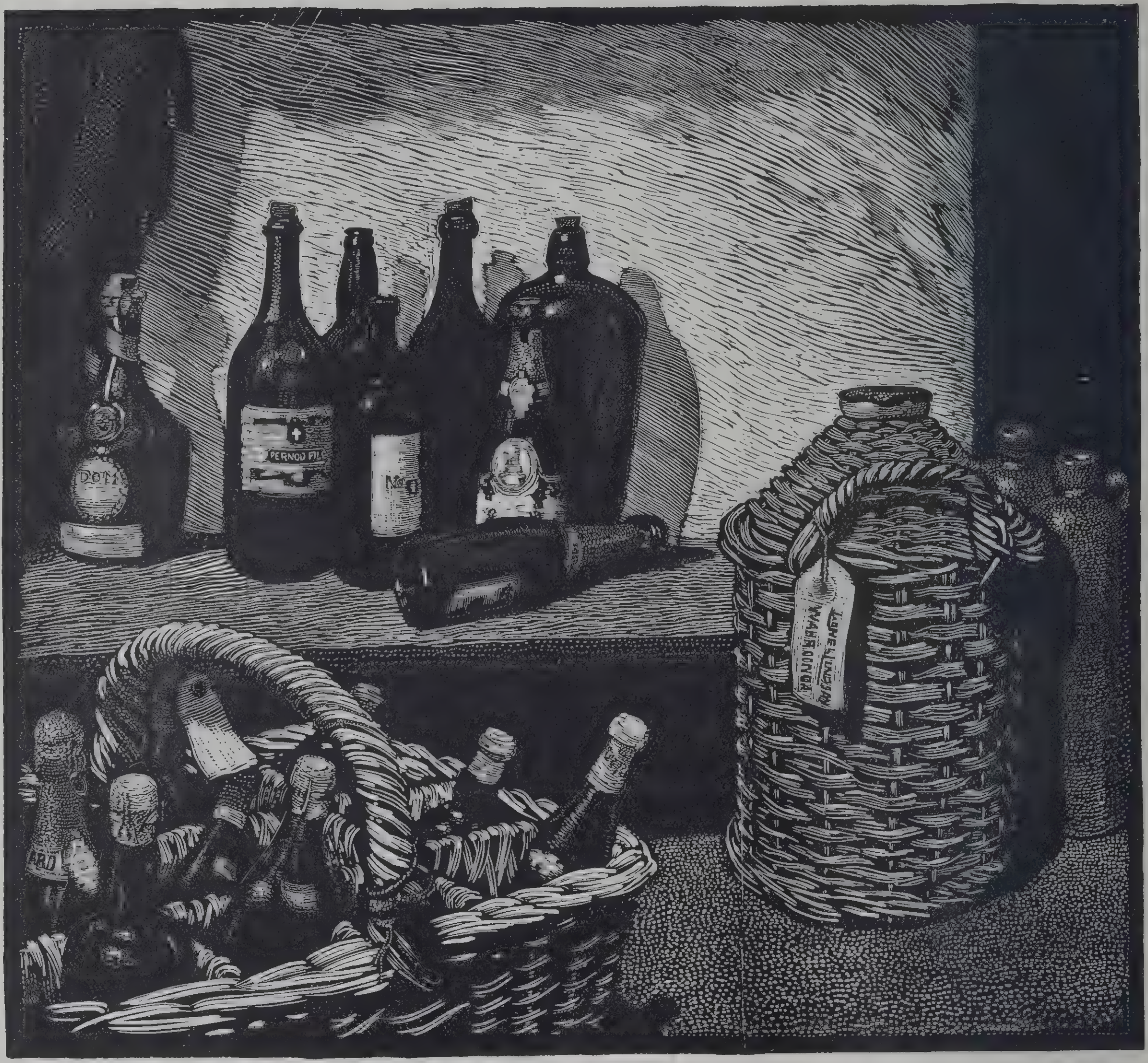
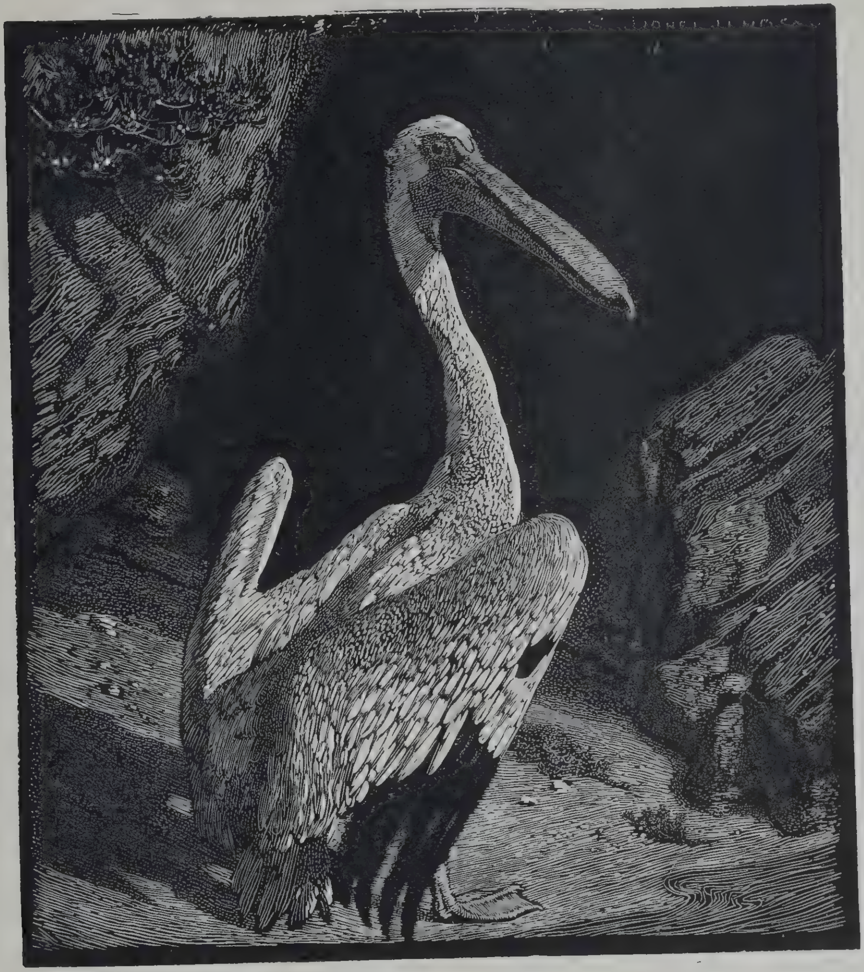


"BACCHANAL"

Woodcut by Lionel Lindsay.

Mr. Lionel Lindsay, who is leaving for Europe next year, recently held three simultaneous exhibitions of woodcuts in Sydney, Melbourne and Adelaide. They proved to be among the most successful exhibitions yet held here, and showed the growing appreciation for this craft in Australia.



"THE PELICAN"

Woodcut by Lionel Lindsay.

THE VILLERS BRETONNEUX MEMORIAL

AUSTRALIA'S GREATEST OVERSEA MONUMENT COMPETITION OPENS

THE great monument in France, which will be erected by Australia to the memory of her soldiers who died on the Western Front, is the subject of an architectural competition commencing to-day. Any Australian architect or designer, wherever resident, may compete, provided that either he or his sons or daughters enlisted for service in the war. The competition is of great importance, since this monument will be not merely this country's main oversea memorial to her soldiers, but the chief example, not only in France, but in Europe, of Australia's architectural and perhaps, sculptural art.

Canada has chosen for her monument Vimy Ridge, the site of the magnificent advance of Canadian troops in April, 1917. That of Australia will be at Villers Bretonneux, near the scene of the most momentous battles in which Australians took part in 1918—those of 4th and 24th April, when German attacks were hurled back from these slopes overlooking Amiens, and the tremendous Allied assault of 8th August, when five Australian, four Canadian, and three British infantry divisions, with a Francy army on their flank, dealt what proved to be the decisive blow to the German armies. The actual site of the memorial is the famous hill where, on 24th April, 1918, when the worn-out troops further south gave way, the 14th Australian Infantry Brigade stood fast, swung back a flank, and held the Germans from the vital summit until the 13th and 15th Australian brigades by a brilliant night attack restored the line.

On that slope, beside the Fouilloy-Villers Bretonneux Road, was a chalk-pit which will be remembered by most soldiers who know the area. Near this on the eastern side of the road where it rounds the hill, there lies to-day the Australian Memorial Cemetery, containing 1205 graves, all Australian or British, except those of one French "poilu" and one American soldier. Towards the top of this enclosure, 400 yards east of the road, is the position for the actual monument. On its right in the woods of the Somme valley lies Corbie, with its beautiful abbey, now being restored; on the left Villers-Bretonneux; and directly in front, rising from the plain twelve miles distant, the cathedral and city of Amiens. This splendid site is in the path of most visitors to the Somme battle area, and is not far from the other—even more crowded—Australian cemeteries at Posieres. It is certain that for all time the monument will be visited by most travellers to Amiens.

The design of the memorial "is left entirely to the imagination and judgment of the competitors"; but the intention is that it shall be an enduring material symbol of those ideals which were the basis of participation by Australia in the Great War, and a fitting monument to the deeds of every Australian who gave his services for the preservation of those ideals. The design must "suitably fulfil" these objects. The memorial must be constructed of enduring materials, and "its architecture should characteristically express such materials." The stone—granite, trachyte, marble, or other durable material—with which it is faced, whether inside or out, must be Australian and must, under supervision by the selected architect, "be executed in Australia . . . . complete and ready for transport to and erection in France." The final erection of the monument in France, together with the execution of the remaining sections of the memorial and adjacent cemetery (a cross, stone of memory, trees, paths) will be carried out under the direction of the architects of the Imperial War Graves Commission, but lay out designs will be suggested by the competing architects.

It is mentioned that those responsible for the acquisition of the site were of opinion that the monument "should provide a means for visitors to view the surroundings from as high an elevation as cost and other conditions permit." (On the surveyed plan the site is marked as that of an "observation tower.")

On the monument are to be recorded—hand-chiselled or cast—in a position where they will be plainly legible, the names of all those who were "missing" in France or Belgium, that is to say, of the 12,000 men who are known to have fallen on those battlefields, but whose bodies have never been found, and whose names, therefore, are not carved upon any gravestone. Thus the names of Australians who died at the front will be twice recorded—once on or near the foreign field in which they lie, and again in their own country in the war memorial at Canberra.

It is proposed to spend upon this memorial £100,000. As this sum is to cover all expenses, including those of planting trees, forming the site, and architects commissions and premiums, it is expected that the amount available for the actual memorial will not exceed £90,000. The premium for the design which is accorded first place is £250; second £250; third £150, and for the next seven, £100 each. The selection will in the first instance be made by a board of adjudicators (Maj. Gen. Sir J. T. Hobbs, K.C.B., F.R.V.I.A., and Messrs. C. Sydney Jones, A.R.I.B.A. and J. S. Murdoch, F.R.V.I.A., Chief Architect of the Commonwealth Government), who will select at least ten designs. Final adjudication will be by an architect to be nominated by the Royal Institute of British Architects. The printed conditions are obtainable at military headquarters in the capital of each State, and at the High Commissioner's Office, London. Designs have to be in by 30th April, 1926.

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ARCHITECTURE

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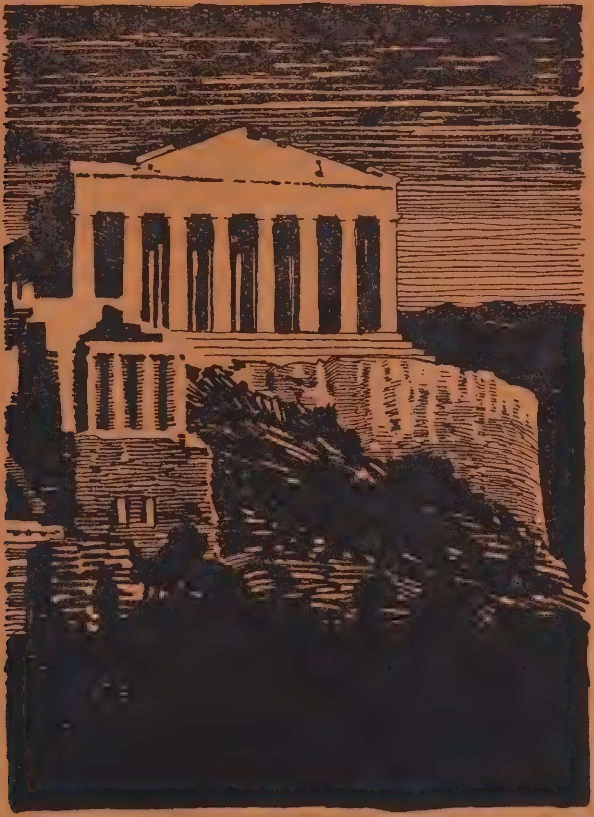

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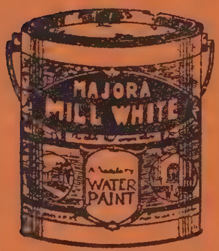

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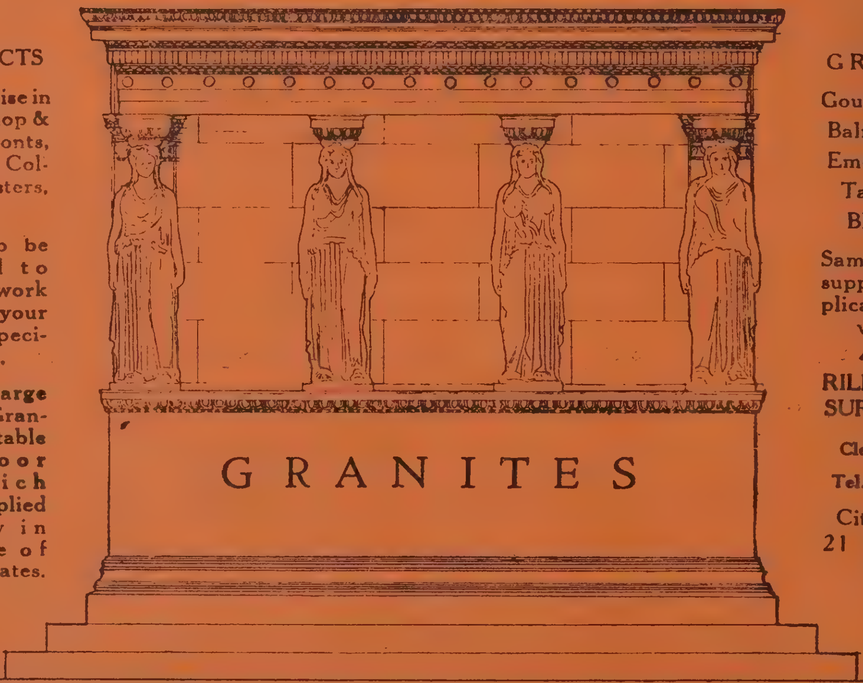

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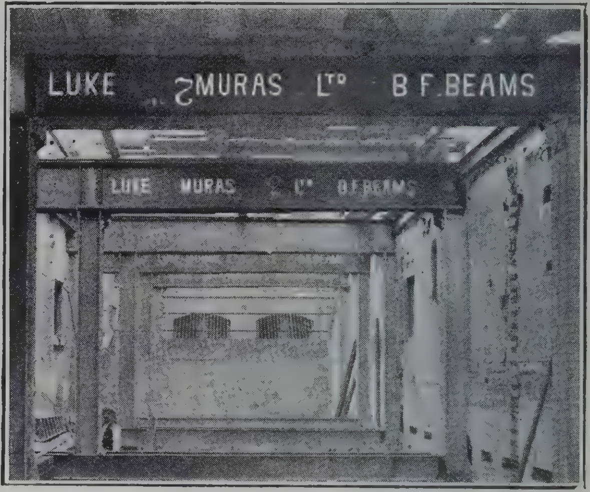

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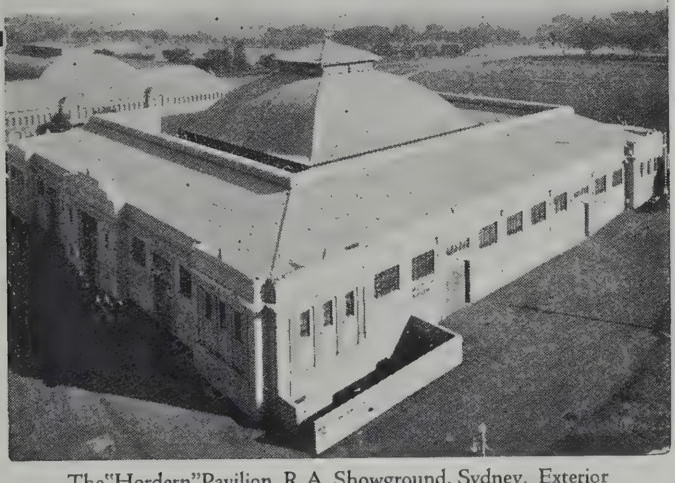

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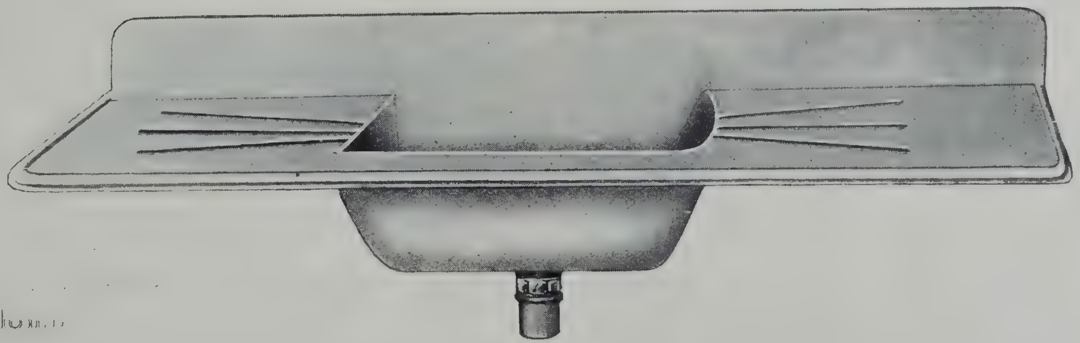

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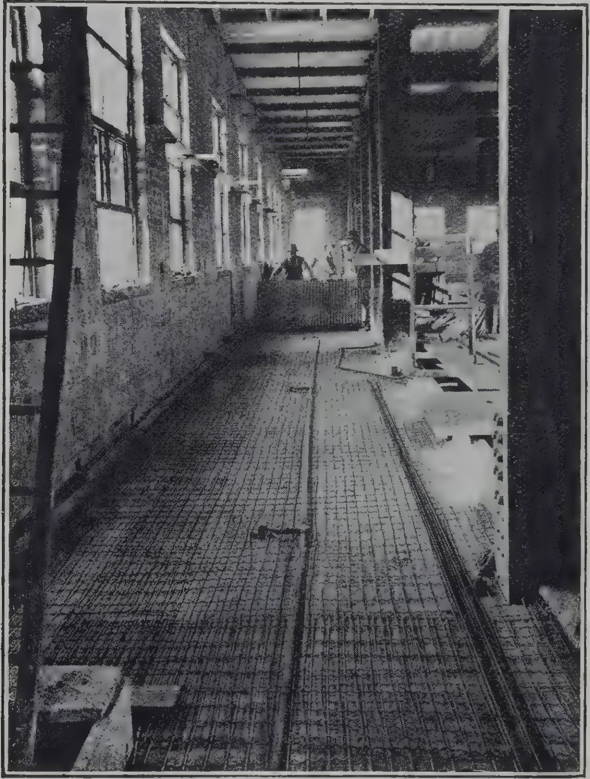

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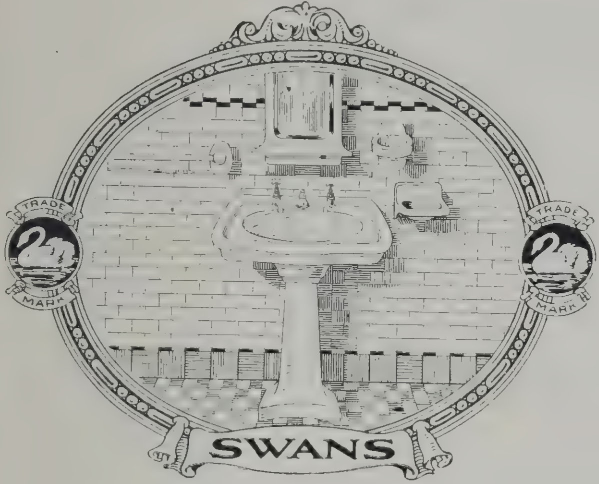

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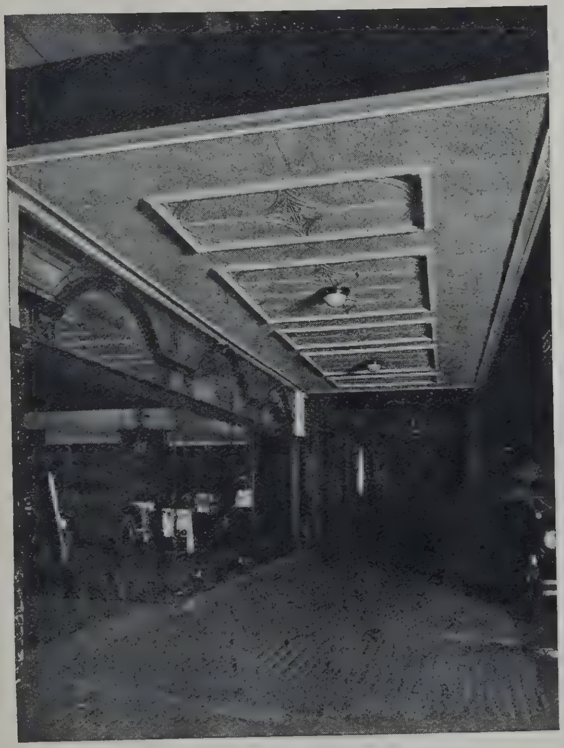

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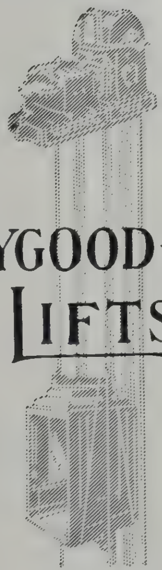

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